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There Is an App for That: Uses of Print and Digital Materials in the Lives of Three Preschoolers

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THERE IS AN APP FOR THAT: USES OF PRINT AND DIGITAL MATERIALS IN THE LIVES OF THREE PRESCHOOLERS

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DEDICATION

This dissertation is dedicated to three of my grandchildren, Aiden, Madilyn, and Makayla, and to their parents. I love you all to the moon and back. I also dedicate it to my mother and father who taught me to love words and showed me what faith looks like. The first Bible verse I ever committed to memory came from *The New Testament* (John 1:1): "In the beginning was the Word, and the Word was with God, and the Word was God." This gift God has given mankind, the Word, has power. So, my children, and my children's children, use your words wisely.

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I want to thank my committee members, Dr. Amy Donnelly and Dr. Heidi Mills, who taught me how to ask questions and question answers, how to see with an inquirer's eye, and how to put children at the center of all that I do as a literacy coach and teacher. I also need to thank Dr. Katie Van Sluys who helped me conceptualize this study and who is now doing great work in the field as she guides teachers in the integration and use of technology within schools. And I thank Dr. Vivian Vasquez, who has been a distant mentor longer than she knows. I truly appreciate her willingness to serve as an external member of my committee.

I thank my husband, Henry, for reminding me to never give up and for believing in me. I also appreciate the support and guidance of family, friends, and colleagues. And finally, I must acknowledge my fellow NCTE bowling team members who first taught me how to tweet, what Web 2.0 meant, and pushed my thinking about what it means to be literate in the 21st century.

ABSTRACT

This ethnographic study examined the uses of print and digital materials in the lives of three preschoolers over a five-month period of time in the children's home and community contexts in the southeast region of the United States. The research question asked: *What can I learn about the literacy practices of three preschoolers as they use print and digital materials in their worlds?* The children were the primary focus of the research, but adults (specifically, the children's mothers) also served as informants. Grounded in sociocultural theory and informed by constructivist and media theories, the study is important because, while we know that young children access digital tools within their learning environments, there is little empirical research to highlight the ways that very young children simultaneously develop both print and digital literacies. To begin to fill that gap, this study examined the ways that three young children learned about and through both print and digital materials. Findings indicate that the children accepted these materials as part of their worlds as they emulated adults, shared the roles of expert and apprentice, transmediated across digital and print experiences, and demonstrated agency within their own literacy development. Additional findings illuminated the ways that adults viewed and provided access to materials, as well as how materials often reflected evidence of racial bias and gender stereotype. Findings suggest implications for adults who support young learners by providing access to and engagements with materials that will allow them to become active, agentive users of literacies in the 21st century.

TABLE OF CONTENTS

LIST OF TABLES

List of Figures

LIST OF ABBREVIATIONS

AAP .....American Academy of Pediatrics

AASL..... The American Association of School Librarians

ALA ..... American Library Association

CCSS ..... Common Core State Standards

IRA ..... International Reading Association

ISTE.....International Society of Technology in Education

NAEYC ..... The National Association for the Education of Young Children

NCTE..... National Council of Teachers of English

CHAPTER ONE

INTRODUCTION TO THE STUDY

During a conversation with my five-year-old grandson, Aiden, he asked me, 'Nana, why do pirates use treasure maps?' I responded, 'I don't know, Aiden. Why did pirates use treasure maps?' He looked up at me and said, 'They have to use treasure maps because they don't have GPS!'

One day while playing on an iPod, my three-year-old granddaughter, Madilyn, held the device up to her grandfather, and asked, 'Papa, where is me?' When she realized he had no idea what she was talking about, she appealed to me, 'Where is me?' I saw that she was using an application in which her brother, Aiden, had an account complete with his name and an avatar. Madilyn wanted her own avatar.

I sat on the couch one evening quietly checking my email and status updates of my Facebook friends while my two-year-old granddaughter, Makayla, watched yet another episode of "Dora, the Explorer." I was quite startled when she tugged on the edges of my iPad and said, 'My turn!' I told her that I needed to work on my iPad right now. She responded, 'No! My pad!'

The vignettes above are but a few of many instances demonstrating moments in the process of three young children coming to understand and uses of the print and digital tools that surround them. The words and actions of these three preschoolers demonstrate cultural awareness of the ways technology plays an increasingly important role in their

day-to-day lives and a desire to have access to, and a command of, these tools. Aiden's comment about the use of maps and global positioning systems nicely captures the way humankind has used different tools throughout history in order to encode and decode meaning for various purposes, as well as how we as a society have adapted by retooling or repurposing tools through advances in technology (Bolter & Grusin, 2000). We no longer have to dig the hole to bury our treasure and then encode its secret location onto a treasure map. Today, *there is an app for that*. This has become a familiar catch phrase in society today as people use digital applications of all kinds to solve a multitude of problems or issues that arise in our lives, even in the literacy learning of young children. However, literacy is a complex process that is intricately intertwined within the culture and context of individual learners. In this study I examined some of the ways in which three young children navigated their world as 21st century language learners. In the midst of a myriad of language interactions, I focused on their uses of print and digital materials.

Statement of the Problem

Children in 2014 are born into a world inundated with technology. They often have a digital footprint long before they are born as expectant parents post photographs of ultrasound images and discuss pregnancy, birth, and early years in chat rooms and on various social networking sites via various digital devices. Children's lives are often chronicled through digital images posted in online scrapbooks or on status updates; news of first words and first steps travel around the globe at lightning speed.

This is the world into which my three youngest grandchildren were born. They are what Prensky (2001) calls, "digital natives" (p. 1). Those with access to digital technology, live in a 21st century world and are learning to mediate and make meaning in

the world through the use of digital tools that allow them to represent thought and communicate with others in very different ways than I did as a child. Much is known about the ways young children learn and grow in their literacy development (Clay, 2000: Genishi & Dyson, 2009; Gregory, Long, & Volk, 2004; Long, 1998; Rowe, 1998). Recently, researchers have begun to examine the ways that young children learn in digital environments (Clark, 2013; Dooley, et al., 2011; Marsh, 2005; Vasquez & Felderman, 2012). And yet, we know little about what happens as very young children negotiate literacies when digital *and* print texts are central to their worlds prior to entering school. While every professional education organization posts standards, guidelines, and position papers regarding the teaching of digital literacies in schools, very little is known about learning that occurs before kindergarten. For this reason, I conducted a five-month qualitative study that examined the experiences of three children, under the age of six, as they used both print and digital materials to navigate the highly technological world in which they lived.

Research Questions

My questions and concerns were rooted in my perspective as an educator, as well as my views as an active participant (grandmother) in the children's day-to-day lives. Through these lenses, I wondered what I might learn from looking at the literacy practices of these children as they engaged with both print and digital materials in home and community settings. To accomplish this, I conducted a qualitative study drawing from ethnographic and multiple case study methodologies in order to understand ways that my three grandchildren used language, texts, and digital tools to mediate new understandings. To explore these phenomena, the question guiding the study was broad:

What can I learn from looking at the literacy practices of a two-year-old, a three-year-old, and a five-year-old as they engage with both print-based and digital-based materials in home and community settings over time?

This broad question was explored through observations of the children in multiple contexts from late May, 2012 through late October, 2012. In doing so, my research was guided by the following sub-questions:

- What tools do children use and for what purposes?
- What do the children do or say as they switch from one tool to another?
- Why do they use particular tools for particular reasons?
- Do some tools conceal and some reveal information in ways the children seem to understand?
- What strategies do adults and children use to support and scaffold or to interrupt digital learning?
- Do children move in and out of roles as experts and apprentices in the uses of these tools and what do they say and do in these roles?
- Do children transmediate across tools? If so, how and why?

Significance of the Study

Just as the opening vignette describing my conversation with Aiden illustrates how navigational tools such as treasure maps and global positioning systems have changed with emerging technologies, media and other tools of our culture are changing the very nature of communication. I have been privy to many of these changes in my lifetime and have incorporated the use of technology in both my personal and professional life. I have always been interested in technology and have embraced its use

within my classroom and in my work with teachers as a literacy coach; however, before I could really fully see the myriad ways the children used print and digital materials in their world, I had to first recognize and reconcile to the fact that I still viewed this highly technological world with print-based blinders. While I was consumer of modern technologies, I had not become literate in a world inundated with digital tools. My own literacy history (a print-based topographic one) caused me to privilege the technologies of my own generation. My interest in technology with regard to this study grew from questions and concerns about the ways in which young children learn about, with, and through the use of digital tools - questions and concerns that point toward gaps in the field of early literacy research as described in the following sections.

The Changing Landscape of Literacy Learning

Much has been written about how children use language and literacy to mediate their worlds and make meaning (Genishi & Dyson, 2009; Harste, Woodward, & Burke, 1984; Lindfors, 1999; Marsh, 2005; Rowe, 1994; Siegel, 2006). Additionally, there have been a number of case studies in the area of language and literacy in which researchers studied their own children, grandchildren, or family members (Bissex, 1980; Long, 1998; Martens, 1996; Vasquez, 2007; White, 1956). However, the field of language and literacy, especially in the area of early childhood, is currently moving into what some researchers call a new frontier as digital tools mediate young children's learning in new ways (Dooley, Flint, Holbrock, May, & Albers, 2011; Vasquez & Felderman, 2012).

Clay (1998) posited that there are many points of entry into literacy and the path of progress may be different for any two children. Changes in media and literacy practices provide new opportunities for points of entry into literacy; however, while

children have always been multi-modal learners, making sense of their worlds through the use of multiple sign systems and modes of learning (Harste, Woodward, & Burke, 1984; Short, Harste, & Burke, 1996), new technologies place new demands on them as they use digital tools to enter literate worlds in new ways (Beard, Myhill, Riley, & Nystrand, 2009). Much is written about how adolescents take on these demands as they use and learn new literacies, as well as how communication practices have changed (Coiro, Knobel, Lankshear, & Leu, 2008; Gee, 2003; Gee & Hayes, 2011; Kress, 2003; Lankshear & Knobel, 2004). However, according to Marsh (2005), "this discourse has yet to permeate widely the field of early childhood literacy" (p. 4). Marsh posited that research in this area has "focused almost entirely on print on paper, and in doing so, has privileged particular modes of communication" (p. 237) and called for more research to be done related to how children make meaning with a wide range of media and modes of communication.

Some feel that the very nature of what it means to be literate is changing today due to the rapid changes in communication practices and that schools must change to meet the needs of tomorrow's learner (Darling-Hammond, 2010). Those who (like me) became literate in a print-based, topographic world cannot continue to draw on former mental models of what it means to be literate. Wells (2002) writes, "Where yesterday is an unreliable guide to tomorrow, and where societies are in complex, heterogeneous flux, we must look to the future, and to the best of current theory, to help us reappraise the means and ends of education" (p. 1). As the expectation and demands of what young learners are to know and are able to do continues to increase through high-stakes testing and narrowing curriculum (Long, Hutchinson, & Neiderhiser, 2011), it seems as if it is

more important than ever to understand the nature of how children are positioned as learners in a digital world.

The impact of a digital world on emergent literacy. Within a recent whitepaper on the impact of a digital world on emergent literacy, Blanchard and Moore (2010) examined the latest literature in the field of early childhood education and the digital environments within which many children are learning today. They found that children are provided many opportunities within which to engage in literacy using digital devices such as cell phones, television, and video games. They posited that, globally, developmental milestones and literacy practices are changing due to the proliferation of digital devices. Consequently, this is bringing about changes in educational practices in both intentional and unintentional ways. While young children may not be accessing these devices, they are watching and learning as family and community members regularly use digital media. The study further suggests that digital media can have a positive impact on literacy development as they offer possibilities for engagement not offered in print material. While the research offers the promise of many positive benefits to children Blanchard and Moore (2010) state, "It is difficult to gauge what is actually happening, because the little that is known about the effects of digital media on emergent literacy skills development comes from educational television and computer studies, as well as from a few studies of other media and surveys" (p. 1).

Professional organization standards and position statements. In response to the changes in communication practices, several organizations have developed standards, position statements, and recommendations focusing specifically on technology and what it means to be literate in the 21st century. The International Society for Technology in

Education (ISTE) suggests that educators prepare their students to live and work in a "technology powered world" (International Society for Technology in Education, 2012, p. 1). Through my own work with The National Council of Teachers of English (NCTE), I participated in the development of a framework for 21st century curriculum and instruction focusing on technology as one area educators need to consider as they engage learners in the 21st century (NCTE, 2008). Additionally, the American Association of School Librarians (AASL) developed standards to address the kinds of skills and dispositions needed by 21st century learners (American Association of School Librarians, 2007). The National Association for the Education of Young Children (NAEYC) recently amended its long-standing position statement about the uses of technology with children from birth through age eight, encouraging educators of young children to "use technology and interactive media in conjunction with other traditional tools and materials in order to support the development and learning of young children" (NAEYC, 2011, p.1). In collaboration with the Fred Rogers Center for Early learning and Children's Media, NAEYC has published position papers on the appropriate use of technology and media with children from birth through age eight (NAEYC, 2011). These position papers acknowledge that technology is indeed here to stay but also recognize that there are conflicting bodies of research about the appropriateness of its use. "Access to technology tools and interactive media should not exclude, diminish, or interfere with children's healthy communication, social interactions, play and other developmentally appropriate activities with peers, family members, and teachers (NAEYC, 2011, p. 5)."

The other side of the information highway. While there seems to be a growing need among educators and parents to understand more about how children learn within digital environments, there are those who caution against the use of technology with very young children (Armstrong & Casement, 2000; Guernsey, 2007; Healy, 1999; Stoll, 1996). Little is known about the long-term effects of new technologies on developing minds or how children mediate the barrage of images and symbols in today's screen-based society. The recently revised position paper by NAEYC closes with a call for more research in the field "to better understand how young children use and learn with technology and interactive media and also to better understand any short- and long-term effects." Additionally, the American Academy of Pediatrics (AAP), in a recently revised position statement, cautioned against any screen exposure for children under the age of two and limited exposure for children under the age of five (Vandewater, et al., 2007). Guernsey (2007) posited, "Cognitive scientists and developmental psychologists are only starting to uncover the holes in their understanding of how very young children are affected by media" (p. xv). As an increasing number of parents are handing their toddlers their smart phones as a means of entertainment and as tools for learning, educators and researchers need to closely examine these issues.

Based on the interest and concern of these and other professional organizations, it is apparent that there is a need for additional research in the field of early childhood and digital literacy development. By looking closely at the ways that the children in this study used both print and digital materials, this research has the potential to add to a growing body of research in this area.

Concluding Thoughts on the Significance of the Study

In sum, this study is significant because few studies focus on very young children and how they develop both print and digital literacies in home and community settings. In spite of the call from professional organizations and the cautionary views of some researchers, little work has been done to explore what happens as very young children transact in a world that is both print and digitally based. While we know much about how young human beings use the tools of their culture to mediate, or make meaning, how these artifacts both reform and shape mental processes and how these tools are shaped by the sociocultural and historic contexts in which children reside (Gee & Hayes, 2011; Genishi & Dyson, 2009; Harste, Woodward & Burke, 1984; Wood, 1998), we know very little about those processes as they relate to new technologies and young children's lives. This study has the potential to add to current understandings of the ways very young children use both print and digital-based materials as they make meaning in the world, and thereby, address gaps in the fields of early childhood education and literacy education.

Definition of Terms

The following terms are used within this dissertation. They are briefly defined below but are more completely discussed in the contexts within which they appear in the review of related literature.

Acts to awareness: Clay (1998) describes this as the process children go through in coming to know. Children engage in literacy acts such as scribbling or turning pages and move to an awareness about the nature of literacy practices such as reading and writing.

Awareness*:* Being able to attend to something, act upon it, or work with it (Clay, 1998).

Computer: As presented in this study, this refers to personal computers that have a central processing unit (CPU), a keyboard, mouse and screen. The screen may or may not be touch screen.

Concepts of Print: As used in the study, concepts of print refer to those ways of knowing about print materials and include such things as the difference between print and pictures as well as letters and words, directionality, return sweep, and the knowledge that, in Western cultures, books are read from front to back and text is read from left to right (Clay, 2000).

Culture: Behaviors and beliefs characteristic of a particular social, ethnic, or age group and consisting primarily of the symbolic, ideational, and intangible aspects of human societies. Street (1995) defines culture as a verb indicating it is a way of being in the world rather than the discrete characteristics of a specific group within a society.

Digital Concepts of Print: The skills necessary for human beings to engage in digital literacies such as right to left manipulation of a touch screen to advance pages in an eBook, touching an icon to launch an application on a tablet, or knowing how to make use of hyperlinks within a given text.

Digital Literacy: Also termed new literacies, media literacies; the repertoire of skills that are developed over time, which include concepts of digital print, and will ultimately allow the individual to use digital tools to communicate and make meaning through digital media. These skills include such things as

communication, information retrieval, and critical thinking in digital environment (Kist, 2005; Lankshear & Knobel, 2008).

Digital Text: Text that is delivered via electronic or digital means or text provided on a digital platform. It may or may not be written text (i.e., it may be a photograph or a video clip).

Directionality: Referring to the concepts about print that young children in Western cultures develop in order to be able to read such as text is read from left to right and pages are turned from right to left. This is sometimes true in digital formats, depending on the text (some texts scroll from the top down).

Download: The act of electronically loading new digital applications or software onto an electronic device; can be done for free or for fee and often involves levels of accessibility depending on the cost of the download.

Early Childhood: The period of life from birth to eight years of age (Marsh, 2005).

Emergent Literacy: A theory of literacy development which recognizes that literacy is an evolving process that begins early in life as children engage with language and printed texts in their worlds (Clay, 1998); the study of "reading and writing behaviors that develop into conventional literacy" (Yaden, Rowe, & MacGillivrays, 1999, p. 1).

Environmental Print: Print found in everyday life such as road signs, restaurants, cereal boxes, etcetera.

iPad: A product of the Apple Corporation which is similar to a personal computer in terms of function and use but it utilizes touch-screen technology similar to that

found in smart phones. Applications for this device are for fee or free on the iTunes website (www.itunes.com).

iPod: A small, hand-held digital device created and marketed by The Apple Corporation which allows the user to download various applications ranging from entertainment (such as music, videos, and games) to productivity (calendars, reminders, word processing tools, etc.). Like the iPad, this device is operated by touch screen technology.

Kinderculture: As defined by Shirley Steinberg and Joe Kincheloe (1997), Kinderculture is the new childhood that is being created and shaped by new information technologies, along with social, political, and economic factors; considers the economic and cultural impact of consumerism on children and families and the ways that popular culture is changing the nature of childhood.

Language: Genishi (2008) defines language as verbal and nonverbal forms of communication; Gee (2011) defines language as "a set of social conventions about how to combine words, phrases, clauses, and sentences to communicate meaning" (p. 15); also used in this study to refer to the primary language spoken in the home environment of the participants. In this case, it is English.

Literacy: A set of social practices patterned by social institutions and power relationships (Barton and Hamilton, 2005); a cultural invention that allows for a delivery system for language or a written version of oral language (Gee & Hayes, 2011). Others define it as the ability to read, write, listen, speak and view within and across multiple sign systems (Harste, et al., 1984). The later is the one to which I subscribe.

Literacy Events: First defined by Heath (1983) as any piece of writing integral to an individual's interactions; any observable activity where literacy has a role (Street, 1995; Barton and Hamilton, 2000).

Literacy Practice: The cultural ways literacy is used or what people do with literacy (Barton and Hamilton, 2000).

Media: This refers to various means of communication which convey messages through visuals, language, and/or sound including, but not limited to television, radio, video, the Internet and newspapers that are widely distributed to the public (Scheibe & Rogow, 2012).

Mediation: Wohlwend (2011) defines it as the "transforming of an identity or an author's idea into a personally meaningful form according to one's personal history and repertoire of social and cultural contexts."

Models of Childhood: Recognizing that different cultures may view childhood in different yet equally legitimate ways; some models see childhood as biological stages of predictable development and in which children are dependent on adults (Piaget, 1969); others view childhood as socially constructed and children as agentive and active participants in the world (Cannella, 1997). I subscribe to the later model.

Multimedia: Relating to communication that is a combination of media such as a website that contains both written text and video content.

New Literacies: a range of semiotic discourses that include yet extend beyond traditional print based literacy of reading and writing; literacies associated with new communication and information technologies (Lankshear & Nobel, 2004).

Nook: An electronic tablet produced and marketed through Barnes and Noble that incorporates touch-screen technology and has expanded capabilities over an electronic reader (e-Reader) as users can download applications for entertainment, gaming, and productivity as well as access the Internet.

Oral Language: Language that is delivered by speech, thinking, gestures or signing.

Parallel Play: A form of play when children are in proximity to other children but not interacting or interfering in the other's play.

Play: Vygotskian theory of play suggests that play actually facilitates cognitive development. Wohlwend (2011) conceives of play as a literacy for making meaning.

Popular Culture: In reference to young children, Marsh (2005) defines this for as a range of texts, artifacts and practices that are popular with large numbers of children and are either commercially produced or produced by children themselves.

Print-Based Materials: Used here to refer to printed material such as books, newspaper, signs, pamphlets, product packaging, etcetera that are not digitally based.

Situated Literacies: the ways in which literacy practices are defined by the institutions and power relations that sustain them (Barton and Hamilton, 2005); literacy is historically situated, ever-changing, and, as Gee (2012) contends, extends to new ways in which to conceive of and practice literacy in a global society.

Social Media: Web-based and mobile technologies designed to allow for interactive dialogue. This has been made possible with the Web 2.0 platform and includes such things as websites, blogs, wikis, and podcasts.

Social Constructivist: A belief system that stresses the social nature of learning as it occurs through collaboration among learners as learners interact within communities of practice (Lave & Wenger, 1991; Vygotsky, 1978).

Syncretic Literacies: As described by Gregory, Long, and Volk (2004), the way that young children blend literacy practices from home, school, popular culture, religion and community to create new forms (syncretism).

Text: This term is expanded from traditional understanding of print-based books and can refer to published books, newspapers, comic books, coloring books, videos, websites, podcasts, environmental print, etcetera.

Third Space: First defined by Oldenburg (1989) as social surroundings beyond home and work such as coffee shops, bars, or hair salons. Gutiérrez (2008) describes third space as zones of proximal development beyond school and home settings such as community and virtual settings; places individuals learn outside of traditional settings.

Touch Screen: An electronic visual display that can detect the presence and location of a touch within the display area (usually with a finger or stylus) by which the functions of the electronic device are controlled (much like that of a mouse). Touch screens are common in devices such as smart phones, tablets, computers, and gaming consoles.

Twenty-first Century Literacies: An expanded definition of literacy that encompasses a collection of competencies needed to communicate effectively in a technological world yet extends beyond the ability to use technology to include other social competencies (NCTE, 2008).

Writing: Gee (2011) defines writing as a secondary delivery system; delivering language that can be spoken, thought, or signed. The early stages of writing involve scribbling and drawing followed by approximation of the alphabetic system to encode meaning.

Theoretical and Conceptual Framework

What we believe about literacy and learning form our theories, and our theories guide our actions (Barton, Hamilton, & Ivanic, 2005). Our beliefs position us in our work and our "day-to-day decisions, whether unconscious or intuitive or conscious, involve carrying out our beliefs in action" (Short Harste, & Burke, 1995). My lived experiences as a parent, classroom teacher, literacy coach, and grandparent, as well as information I have gleaned from my own inquiries, professional conversations, and professional literature influence how I view the world. What I see and how I interpret what I see is always framed by those evolving beliefs. At this point in my thinking, my beliefs position me as what I call a critical, sociocultural constructivist.

Central to my theoretical framework is the belief that learning is social and that children access the contexts of their lives to make meaning in the world. My beliefs are built on the foundation of sociocultural theory and informed by research in the fields of constructivist and media theory. Like Gee (2011) I believe that the very nature of language and literacy involves issues of power; therefore, I cannot ignore the influence of

critical theory on my belief system. A graphic representation of the multiple lenses through which I conducted this research and the follows (Figure 1.1):

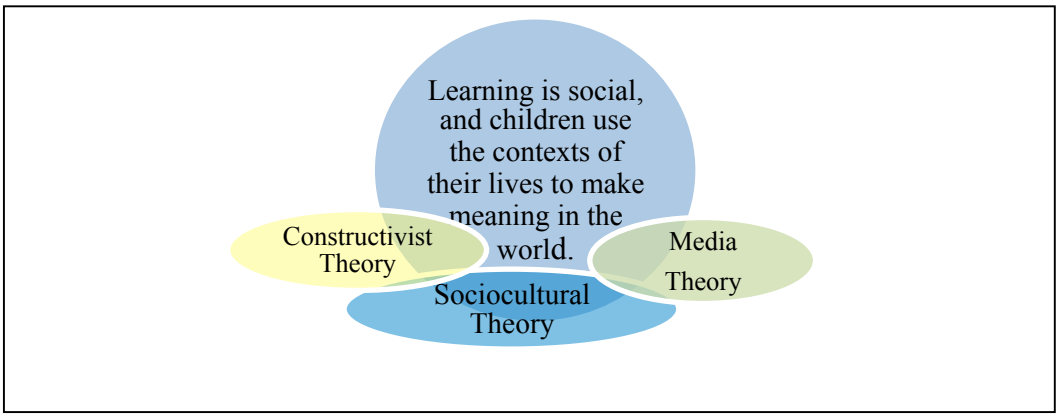

Figure 1.1. Graphic respresentation of the theoretical framework guiding the study

Sociocultural Theory

My beliefs about language, literacy, and learning have developed over my lifetime of experiences as a teacher, parent, and researcher and are undergirded by the sociocultural stance that guides my work as a teacher and as a researcher. This stance recognizes the social nature of learning and the ways in which knowledge is socially constructed within a variety of social contexts. Originating with the work of social constructivist Lev Vygotsky (1978), sociocultural theory recognizes that children access the tools of their culture and that learning is mediated by speech and interactions with others within social contexts. Key to this notion is the recognition that determining learning capabilities involved more than developmental levels. Vygotsky posited, "Developmental processes do not coincide with learning processes. Rather, the developmental process lags behind the learning process; this sequence then results in zones of proximal development" (p. 90). I am informed by Vygotsky's notion that

learning is often mediated by more knowledgeable individuals within their social contexts and that children move in and out of the role of novice and expert.

Additionally, the work of Barbara Rogoff (1990, 2003) deepened my understanding of the social nature of learning and informed by thinking throughout this study as I considered the cultural nature of literacy development. Her work challenged traditional models of childhood that influenced me in the past, which was Eurocentric and based solely on biological and psychological development. Rogoff (2003) viewed childhood and learning through a cultural perspective in which learners are scaffolded through guided participation into increasingly complex thinking as they move in and out of the role of expert and apprentice as they engage with experts in various contexts. Her views on language and literacy learning have had a direct impact on my work as a teacher and teacher leader as I incorporated her views about adults as guides who support children through purposeful observation and the ways in which I consider how children use cultural tools for thinking. These cultural tools include the use of language and other manmade tools such as paper, writing utensils, or computers.

My thinking was also influenced by Bronfenbrenner's (1979, 2005) model of child development as it provided me with visual representation of the many layers of social influences within the life of an individual and helped me reconceptualize how children learn within intricate social networks. The model supports a view of child development that can be understood in terms of rings of influence within the social life of the child. The model is conceptualized as rings which begin with the individual at the center of the system and extend out to encompass: (a) the microsystem, which are the influences of family, church, and peers, as well as symbols and language (b) the

mesosytems, which involve the contexts within which the child participates, (c) the exosystem, which involves mass media and society at large and with which the child is influenced either directly or indirectly, and (d) the macarosystem, which involves the impact of cultural contexts. Additionally, Bronfenbrenner (2005) added a fifth ring in which he recognized the influence of time which encompassed both the socio-historical time as well as life events within the life of the child. I concur with this model with the exception that the rings moving away from the individual might imply a diminished impact (that is to say that it would appear that on first looking at the model it might appear that culture had less immediate impact on a child than the child's family). Therefore, I would suggest a cross section model in which all of these rings of socio-cultural influence are potentially equally impactful in the life of a child.

Building on the traditions of these foundational theorists are more contemporary sociocultural theorists who demand that educators challenge deficit views of children and learning and look for the resources that all children bring to opportunities to learn (Dantas & Manyak, 2010; Lopez-Robertson, Long, & Turner-Nash, 2010). The majority of my 24 years as an educator have been spent in high-poverty public schools. I have witnessed first-hand the damaging effects of a readiness model that positions children as language and experientially deprived, effectively keeping them from becoming members of the "literacy club" (Smith, 1988, p. 9). Additionally, I have read about and seen firsthand the power of tapping into the vast funds of knowledge that exist in homes and communities (Gonzallez, Moll, & Amanti, 1992; Long, Anderson, Clark, & McCraw, 2008). I have seen how interacting with more experienced others (Vygotsky, 1978) and, in particular, coming to recognize the other and often invisible teachers in children's home and

community lives can create contexts where children more effectively make meaning in the world (Gregory, et al., 2004).

This body of work has long influenced my thinking which is continuously sharpened by the work of these and other sociocultural theorists who take a critical stance. In particular, I am led to deeper reflections about issues of equity in education as I considered studies of home and community literacies that focused on the privileging of some literacies over others (Delpit, 2002, 2012; Long, et al., 2013; Miller, 2012; Neito, 2000; Souto-Manning, 2010). However, although I entered this study with what I thought was the ability to use that knowledge to recognize the privileging of dominant groups (Long, et al., 2008), as will be discussed in this dissertation, the study itself sharpened that lens in new and important ways.

Constructivists

As we go about the business of constructing our own realities in life, we are influenced by the collective constructions of others. Consequently, my understanding of literacy and learning has been mediated by the work of noted social constructivists and fellow educators. I recognize knowledge is constructed within individuals; I am informed by the work of constructivists who believe that knowledge is tentative and subject to change based on changing evidence of the learner and that learning is an active process in which each individual must construct knowledge from experiences (Dewey, 1938; Vygotsky, 1978).

I recognize that constructivist theory is also grounded in the work of Jean Piaget (1969) and that his theories continue to influence current understandings of the ways in which children develop and learn (particularly as it relates to early childhood education

and developmentally appropriate practices). One long standing view of early childhood which is still prevalent in schools today is the assumption based on the work of Piaget and Inhelder (1969, 1973) that very young children must be at a certain stage in their development to learn certain skills or strategies. They advanced the notion that the biological development of children was closely related to their cognitive development as they moved through these stages of Sensorimotor, Preoperational, Concrete Operational, and Formal Operational development. While I agree with Piaget's theory pertaining to how learners construct new knowledge through accommodation and assimilation, I do not ascribe to the defined developmental stages presented in his theory (Piaget, 1969). Far too often, these assumptions, and the push for developmentally appropriate practices, have led many well-meaning teachers, caregivers, and parents to limit learning opportunities rather than opening up possibilities for children. My views have been influenced by personal experience through years of working as a teacher and literacy coach as well as by the work of those who have challenged me to deconstruct current constructs, particularly views about the nature of childhood development and the nature of literacy learning (Cannella, 1997; Donaldson, 1978; Razfar & Gutiérrez, 2003).

Deconstructing and reconstructing. I distinctly remember the cognitive dissonance felt when I first read the work of Gaile Cannella (1997) and her words challenged me to reconsider longstanding beliefs that I had held about children and learning. It had never occurred to me to challenge theory or pedagogy. I had been indoctrinated through years of schooling into the notion of single truths. I feel that this epiphany is crucial to my framework because her work not only challenged my former construct of early childhood education (particularly fixed developmental stages and

developmentally appropriate practice), but also helped me conceptualize my understanding of social constructivism as I experienced first-hand the ways in which my learning was mediated by distant mentors. In other words, the transaction that I had through reading her work changed my thinking, an important tenant in social-constructivist theory. Cannella (1997) informed my thinking as I considered an alternative model of childhood in which children are seen as agentive and active participants in the world, and she reminded me of the responsibility of those who seek to deconstruct to reconstruct alternative models that have the potential to bring about positive social change.

My thinking is also influenced by the work of Margaret Donaldson (1979) who challenged the assertions of Piagetian stage theory and Chomsky's language acquisition theory and purported "It appears, then, that the theories about the growth of language and thinking which have been most influential over recent years are, in important respects, ill-founded" (p. 56). Like Donaldson, I believe that children are often capable of deductive reasoning and that, "a child's ability to learn language is indeed something at which we may wonder" (p. 56).

Razfar and Gutiérrez (2003) purport that for more than 50 years it was believed that literacy development began with formal schooling and drew on Teal and Sulzby (1986) when they stated that "From this perspective, it was believed that the mental processes necessary for reading were fundamentally intrapersonal cognitive processes that would unfold in concert with biological development" (p. 36). This readiness model was challenged by sociocultural researchers who advanced the notion of *emergent literacy* development in which it was recognized that children develop reading and

writing like behaviors long before they enter formal schooling (Clay, 1998), and others stressed the importance of parents, caregivers, and a literacy-rich environment in the development of early literacy skills (Genishi & Dyson, 2009; Heath, 1983; Hull & Shultz, 2002; Long et al., 2008). Therefore, I do not subscribe to a developmental approach of learning in which literacy is seen as a set of discrete skills to be mastered incrementally, but rather agree with Razfar & Gutiérrez (2003) who state, "literacy learning is a socially mediated process that cannot be understood apart from its context of development, the forms of mediation available, and the nature of participation across various cultural practices" (p. 34).

Media Theory

My beliefs are also informed by the field of media theory. In an age of mass communication and globalization, we are bombarded by messages from mass media. As a child of the 1950s, I have experienced first-hand the influence of media within my lifetime; however, like so many others, I have gone through my life unaware of the tremendous influence those technologies have had on my personal belief system and understanding of others (Guernsey, 2007; Rushkoff, 2013). It is not that I think that I have gone through life with blinders on, but rather that an awareness of the impact of media requires a conscious effort on the part of individuals and that I had not been cognizant of its impact on me until I began looking closely at how media might be impacting my own children and grandchildren. This brought me to the field of media studies, also known by various terms such as communication studies or media literacy (Baker, 2012; Scheibe and Rogow, 2012).

Foundational theorists. The field of communication theory draws on a broad research base from the social sciences and humanities and involves the ways in which media are used, how media influence society, as well as how society influences media (Sheibe and Rogow, 2012). Grounded in the foundational work theorists such as Innis (1951) and McLuhan (1962), and more recently Ott & Mack (2010) and Rushkoff (2013), communication theory examines the ways that media impacts society and cognition. Innis (1951) divided media into what he termed time-binding and space-binding. While it seems ironic that these early theorists provided insight into the highly technological world in which we live today, their theories are perhaps more applicable today than in the time in which they were written (Fang, 2012; Rushkoff, 2013). Like these early theorists, I believe that individuals and societies are influenced and changed by the media within which they engage. More recently, Fang (2012) posited:

> History has repeatedly demonstrated the capacity that communication media have to affect our lives. Each new medium brought in its wake a pattern of change distinct to that medium...each medium creates its own pattern, its own signature of human behavior. (p. 4)

***Media ecology*.** McLuhan (1966) advanced the theory that media could be viewed as an ecological model. That is, media and communication practices change as each new form of media replaces older technology. His work informed my thinking as I abandoned the notion that technology was limited to computers and digital devices and helped me understand and conceptualize technology as any extension of human senses. As each new technology has been introduced, from the alphabet to the internet, the medium has brought about subtle and profound changes within society (Fang, 2012,). Media includes all forms of technology that are an extension of ourselves (McLuhan, 1964). McLuhan posited that the "medium is the massage" (p. 9), implying that each new medium brings

with it its own unique change within society. More than 50 years ago, McLuhan (1962) prophetically posited:

> If a new technology extends one or more of our senses outside us into the social world, then new ratios among all of our senses will occur in that particular culture. It is comparable to what happens when a new note is added to a melody. And when the sense ratios alter in any culture then what had appeared lucid before may suddenly become opaque, and what had been vague or opaque will become translucent. (41)

More recently, media theorists have revisited the ideas and theories advanced by these early communication theorists. Federman (2004) contended that understanding this notion of "the medium as the message" was pertinent in our society today because "it is not the content or use of the innovation, but the change in inter-personal dynamics that the innovation brings with it" (p. 1). Regardless of the medium within which children engage in literacy events, whether a children's book or a computer application, I believe that they benefit from doing so within social contexts that involve engagements with others in their lives. Like Fang (2012) I believe that "much of our use of media is routine and baked into our lives" (p. 4), perhaps, so much so that it may very well be changing the way in which individuals think and learn.

Media and cognition. As the use of multimedia became more prevalent in education, researchers examined the ways in which electronic media (particularly television) affected cognition and attention (Guernsey, 2007) and more recent studies have explored the impact of video games and use of social media on learning (Gee, 2003, 2011; Leu, 2004; Vasquez, 2013). Just as Bolter and Grusin (2000) discuss the ways in which media has been repurposed or *remediated* for new uses within society, Hayles (2012) posited that the very act of using digital tools "may be extraordinarily effective in retaining (or more accurately repurposing) our neural circuitry" (p. 2). I am influenced

by her work that suggests that these changes are both psychological and physical and could be leading to a diminished ability to concentrate, read deeply, and engage socially.

Additionally, I recognize that media is a pervasive force in our lives today and that media will mold and shape the cultural identities of the three children in this study. Consequently, my beliefs are also influenced by the work of Cortés (2000) who explored the ways in which mass media vicariously teach mainstream culture and the ways in which multiculturalism is taught or not taught through multimedia.

Media and culture. Additionally, I am influenced by researchers who have expanded my understanding of the ways in which culture are intricately intertwined with language and literacy development as well as the complex ways learning takes place beyond the confines of the school walls (Gregory, et al., 2004; Janks, 2010: Kress, 2003: Street, 1995). The work of Gutiérrez (2008) influenced how I viewed the use of technology as I support the idea of learning taking place in a third space beyond home and school. In addition, I embrace the theory of syncretic literacies purported by Gregory, Long and Volk (2004) which recognizes the way that young children blend literacies from home, school, popular culture, and community settings. This line of research has led me to think of *culture* not as a static, fixed entity, but as a verb (Gutiérrez, 2008; Street, 1995), as the way people live culturally. Today, there is no escaping the impact of multimedia on culture. This poses the question, "Whose culture?" Consequently, my theoretical framework is influenced by researchers and theorists who have led me to consider the ways in which media potentially reflects, creates, and perpetuates bias and marginalization within the lives of all children (Gee, 2011; Marsh, 2005; Vasquez & Felderman, 2012). Therefore, I cannot ignore the importance of critical theory on my

belief system and my views about the ways in which media positions learners in the world today. As Vasquez (2013) states, "The point of view from which a map is created results in the inclusion of some things and the exclusion of other things" (59). My beliefs on the critical nature of language, literacy, and learning influenced the ways in which I viewed the children as they used print and digital materials.

Conclusion to Chapter One

Children typically engage with the contexts of their lives as they make meaning in the world (Rogoff, 2003). In today's world, the tools used to do so may be digital in nature. The pervasiveness of technology in the lives of children today offers great promise for accessing information and opening up the world, but is not without challenges. This study considered ways that three children used both print and digital materials in their worlds. The work was influenced by my sociocultural constructivist beliefs and informed by a growing critical perspective, which informed and reformed my thinking throughout the research. I recognize that these words and the beliefs that undergird them are temporary, infused with my own cultural constructs at this moment in time, and are therefore subject to change based on new evidence or transactions through face-to-face or distant engagements with more experts others in both print and digital formats.

Although a great deal is known about the ways adolescents are using digital materials today, little is known about the ways very young children are simultaneously learning about and through both print and digital materials. I believe this study has the potential to inform the field of early childhood education as well as to raise important questions as parents, caretakers, and educators consider the ways in which young children

engage in both print and digital materials in home, community, and school settings. In the following chapter, I will discuss the literature that informed the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The field of language and literacy education contains a vast amount of research espousing multiple perspectives on the nature of literacy teaching and learning. In the review of literature that follows, I have chosen to discuss five intersecting bodies of work: (a) sociocultural theory (b) semiotics (c) young children's language and literacy development (d) digital literacies, and (e) parents and grandparents as researchers in literacy studies. I selected these bodies of theory and research because they have both positioned me in this research and informed my thinking throughout the process of data collection and analysis. I present studies and theory organized in this way to provide a context for this study theoretically, conceptually, and methodologically.

Sociocultural Theory

Sociocultural theory is an approach which emphasizes the social worlds within which language learning occurs and the ways in which those worlds create and are created by cognition and is made up of a rich history of qualitative researchers who seek to illuminate the ways in which human development and learning are socially and culturally constructed (Gregory, et al., 2004; Rogoff, 1990; Street, 1995). As Perry (2012) points out there is no single sociocultural theory on language and literacy learning. According to this approach, learning is deeply embedded in the daily social interactions of the learner and the very nature of what defines literacy within a society is determined by the ways in which individuals use language to make meaning in the world.

Sociocultural theory has been contextualized within a long tradition of rich, ethnographic studies involving home and community literacies, literacy as social practice, studies in multiple literacies, and most recently, critical sociocultural studies that examine power structures and issues of privilege and oppression, and continues to expand what is known about the nature of language and literacy development. Through this review of literature concerning sociocultural theory, I provide (a) a brief historical overview, and (b) the basic tenets of sociocultural theory.

A Brief Historical Overview

A sociocultural approach to studies in language and literacy grew out of multiple disciplines and has its foundation in psychology, anthropology, philosophy, and linguistics. Drawing on methods from the field of anthropology, sociocultural researchers find real-world settings the best laboratory in which to observe the nature of literacy learning (Genishi & Dyson, 2005, 2009; Wolcott, 1995). Grounded in the work of Vygotsky (1978) a sociocultural perspective suggests that learning is a process of making use of tools for thinking made available by individuals within communities, cultures, or societies who initially act as interpreters and guides as children grow and develop (Razfar & Gutiérrez, 2003; Rogoff, 1990).

Central to Vygotsky's theory was the concept of the Zone of Proximal Development (ZPD). Vygotsky defined it as: "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). Chaiklin (2003) described this as "the intersection of a more competent person and a less competent

person on a task, such that the less competent person becomes independently proficient at what was initially a jointly-accomplished task" (p. 2). Vygotsky viewed language as a tool of thought. Vygotsky (1978) wrote, "Thought is born through words" (p. 282). For Vygotsky, speech played a critical role in the child's learning in the Zone of Proximal Development (ZPD). Language is one of those tools for thinking which we use to make sense of the world. Lindfors (1987) writes: "Because language supports our going beyond, it makes a significant contribution toward our comprehending and learning, toward our building a theory of the world which includes what is and is not, and also what could *be*" (p. 272).

Building on Vogotsky's work and groundbreaking ethnographic studies in the field expands this notion to recognize the importance of social interactions in home and community settings (Dantas & Mnyak, 2010; Gonzallez, et al., 1992; Heath, 1983, 2012; Moll & Greenburg, 1990). Wells (1999) wrote "learning and teaching in the ZPD is clearly dependent on social interactions and, in educational settings, this most typically involves face-to-face interactions mediated by speech" (p. 3). Language, then, serves as one way of mediating the world.

Home and community literacies. In the past twenty-five years, the work of researchers grounded in sociocultural theory have brought about great advances in the field of language and literacy through conducting ethnographic studies in home and community settings (Gregory, et al., 2004; Heath 1983, 2012; Long, 1998, 2004, 2008; Genishi and Dyson, 2005, 2009; Rogoff, 1990, 2003). Many studies have considered out of school literacies and the ways in which children learn beyond the school walls (Dantas & Manyak, 2010; Gregory et al., 2004; Hull & Shultz, 2002; Long et al., 2008; Vasquez,

2005). Other researchers have explored the ways in which individuals use language and the functions they serve in their day to day lives (Gee & Hayes, 2011; Harste, et al., 1984; Lindfors, 1987).

Case study in home and community settings. The extensive ethnographic study conducted by anthropologist Shirley Brice Heath (1983, 2012) contributed greatly to what is known about literacy development and the tremendous influence of home cultures on a child's success or failure due to the way in which schools privilege certain literacies over others. Her initial study took her into the field for almost a decade as she studied the culture and literacy practices of the members of two communities located in a rural, southern location that she named Trackton and Roadville (Heath, 1983). She rejected the notion that class and race were the source of failure for many children in schools, and her work illuminated the fact that there are many literacies and discourse structures present in home environments that are not validated or recognized in schools; therefore, success in school and work settings is measured on a narrow understanding of what counts as teaching, learning, and literacy.

Recently Heath (2012) has chronicled the past three decades as the families faced economic and social challenges of the new millennium including economic hardships and adjusting to the highly technological world in which they live (Heath, 2012). Heath further investigated the ways the families negotiated and communicated in digital environments. In many ways, this most recent work focused more on the deficits within the lives of these families as the challenges of economic hardships, the disbanding of the centrality of the communities through moving to other locations to live and work, and the ways that technology had at times impeded social and emotional growth within the youth

impacting their lives negatively. She found that the families engaged less in the kinds of deliberate talk that helped young children develop competencies for problem solving or self-monitoring throughout their lives.

Additional studies in home and community settings have worked to illuminate the richly literate environments that children live and play in within home and community settings. These studies have helped to expand the definition of what counts as literacy beyond traditional school-style literacy and recognize the funds of knowledge that children bring from home and community (Gonzalez, Moll, & Amanti, 2005) as well as the ways children learn from the networks of support in their lives (Gregory, et al., 2004). These studies provide evidence of the rich contexts in which children interact within multilingual and multicultural contexts and challenge the deficit model that has pervaded public sentiment, as well as public policy, in school settings. In looking closely at several of these studies, it is apparent that, as Dantas & Manyak (2010) purported, children come to learning experiences well equipped with many resources from their home and community.

Home and school literacies in urban settings. Other influential ethnographic studies conducted in home and community settings have had a tremendous impact on the field. The work of ethnographers Denny Taylor and Catherine Dorsey-Gaines (1988) contributed greatly to what was known about the importance of home and school literacies. They specifically looked at how children growing up in urban poverty developed literacy. Their research was conducted in the home setting and demonstrated the importance of family involvement in the literacy development of children. Their ethnographic study of families living in urban poverty challenged the notion that the

homes lacked literacy. They found that the families engaged in many acts of literacy including such things as reading for a variety of purposes including information, socialization, and recreation, as well as writing for information, entertainment, and to aid memory. Their work demonstrated a richly literate environment and that school failure should be attributed to the failure of schools to tap into family literacies rather than the lack thereof.

These and many other researchers have worked to counter the narrative of the prevailing deficit model which views children from marginalized communities as lacking the skills needed to be successful in school and focuses on what they do not know (Gonzalez, 2006; Haight, 2001; Long, Volk & Gregory, 2007; Long, et al., 2008; McCarty; 2003. Much research has been conducted in the area of language acquisition and learning in marginalized cultures (Boutte, 2007; Delpit, 1996; Delpit & Dowdy, 2002; Neito, 2000; Ogulnick, 2000) and researchers continue to work to expand and inform the field. These and other studies have explored the many ways that language and literacy are culturally bound, and have begun to bridge the gap between learning in and out of school by recognizing that all children come to school with a rich history of language development on which to build. Ogulnick (2000) described her own journey as a language learner and her awareness that we are "socialized into a culture through words, tone, and implicit understandings of one's place, and that there are penalties for people who violate the rules." (p. 1). This resonated with me as I considered other studies which have helped me to understand how language is closely tied to issues of power and the political nature of literacy (Janks, 2010; Kinloch, 2012; Taylor & Dorsey-Gaines, 1988).

New literacy studies. Sociocultural researchers work to expand current constructs about the nature of language and literacy. This is precisely what a group of researchers did in the last decade of the 20th century through the new literacy studies. The work of The New London Group (1991), a team of 10 leading researchers in the field of language and literacy studies, advanced the current understanding of literacy to encompass multiple literacies (Luke & Freebody, 1997). These and other researchers called for a paradigm shift that recognized the many ways that language is used to make meaning and facilitate learning in and across various cultural settings in a global and technologically connected world. Researchers continue to work to examine the ways in which language learners are making meaning through new technologies and within real and virtual spaces. These researchers will be explored more deeply as I examine digital literacies later in this review of literature.

Basic Tenets of Sociocultural Theory

Researchers in the field seek to examine the ways in which individuals use and learn literacy in the world and strategies and teaching/learning partners supporting that learning. Research grounded in sociocultural theory is most often ethnographic and its emphasis on thick-rich description, provides researchers with a way to "expose a culture's normalcy without reducing its particularity" (Gertz, 1973, p. 17). Perhaps the greatest contribution sociocultural researchers have made to the field of language and literacy is in helping to begin to bring about a paradigm shift in the way culture, language, and literacy are perceived and defined. The lens through which individuals conceive of culture is influenced by their beliefs. Ladson- Billings (1995) writes, "We do not really see through our eyes or hear through our ears, but through our beliefs" (p. 46).

Truth is often tied to what a person knows or has been taught to believe through the process of acculturation as opposed to valuing the truths of those who may hold differing perspectives. Many people, and quite often educators, view knowledge as truth, but what is a truth to one culture is an untruth to another (Souto-Manning, 2010). Likewise, assumptions about what may be true for the culture of one family may not be true for another.

Redefining culture. Many researchers resist defining culture because as Street (1995) contended, the very nature of culture defies definition. Far too often culture is narrowly defined by characteristics that accentuate the differences among people and these differences can be perceived as deficits (Dantas & Mantak 2010). Gutiérrez (2008) called for a re-envisioning of culture not as a noun, but as a verb that defines culture through the actions and practices individuals engage in rather than the characteristics that define differences from the dominant mainstream culture (Street, 1995; Street & Heath, 2008). For sociocultural theorists, culture is then conceived of as a dynamic ever-changing phenomenon as individuals use language and literacy to engage in social practice. As members of a culture appropriate new tools to solve problems or do work, they apprentice young learners into these new social practices through purposeful interactions as they engage in those practices together (Rogoff, 1990).

Literacy as social practices. Literacy is a somewhat illusive term to define, and in fact, Janks (2010) points out that many languages do not even have a word for the concept. Once thought of in narrow terms as the opposite of illiteracy particularly as related to abilities to access print-based media, literacy is now seen in much broader terms. Street (1995) challenged the prevailing notion of literacy as the ability to read and

write in the dominant language of a culture when he argued that literacy is social practice. Barton and Hamilton (2000) expanded the understanding of literacy as social practice, focusing their work on social relationships rather than a set of discrete skills or set of properties within individuals. Much like Street (1995) they differentiate between *literacy events* and *literacy practices*, defining literacy events as "activities where literacy has a role" (p. 8). Literacy practices are "the general cultural ways of utilizing written language which people draw upon in their lives" (p. 7) and are governed by social institutions and power relationships.

Theorists who espouse a sociocultural stance believe that children engage in literacy events and develop literacy practices within intricate social networks (Long & Volk, 2007) and spin what Geertz (1973) describes as intricate webs of significance. It is within these intricate webs that children participate in cultural activities with the guidance of more skilled partners allowing them to internalize the tools for thinking and for taking more mature approaches to problems that children have practiced in a social context (Vygotsky, 1978).

Mediated learning. Key to learning according to a sociocultural approach is the mediation of learning by others and within social situations (Gregory & Long, 2004). Feuerstein and Lewin-Benham (2012) define mediating children's learning as "any interaction in which an adult intends to convey a particular meaning or skill and encouraged the child to transcend, that is, to relate the meaning to some other thought or experience" (p. 1). Transcendence is the act of taking what is learned in one situation and using it in a new situation. The more knowledgeable individual acts as the expert (Vygotsky, 1978) and learning is mediated by the use of tools within the culture. While

learning often involves face-to-face mediation by experts in the life of a child, it can also take place vicariously through interactions with texts in both print and digital environments. The expert in this case is the author, the computer programmer, or the voice mediating applications within digital devices. The resulting experience is a transaction between the reader and the text.

Transactional theory. This notion of transaction was advanced by John Dewey (1938) and Louise Rosenblatt (1995) and is known as transactional theory. Dewey (1938) believed that each experience is a transaction between the learner and the environment at that particular moment in time. Louise Rosenblatt (1978) argued that meaning does not reside in the words on the page or within the reader, but rather within the transaction of the reader and the text. Rosenblatt described this as the "poem" (p. 123). Central to her theory was the notion that each reader reads a text in two distinct ways, both efferently (an attempt by the reader to understand the text) and aesthetically (their own unique engagement with the text). This theory stood in stark contrast to the stance of New Criticism, which prevailed through much of the first half of the 20th century, in which meaning resided in the words and teachers were to teach predetermined interpretations with little or no attention to the experiences of the reader. Rosenblatt (1938) posited, "There is no such thing as a generic reader or a generic literary work; there are in reality only the potential millions of individual readers of the potential millions of individual literary works" (p. 32).

Furthermore, Rosenblatt (1986) pointed out that there is a mix of both public and private meaning involved and that the reader shifts between the efferent and aesthetic

stance; while someone else can read a text efferently for us, no one else can evoke the same meaning as that of individual readers.

Additionally, the work of Kenneth Goodman et al. (1986) further extended the theory to examine the way in which the transactions that children have with others change or extend meaning making. These transactions occur in face-to-face encounters through conversations as well as with texts. Whitmore et al. (2005) extended this to include the way that learners transact with others (adults and peers) as well as cultural tools, all of which serve to mediate learning. More recently, this has been extended to include transactions with new technologies as learning is mediated within virtual spaces (Gee, 2012; Leu, 2012; Marsh, 2005).

Syncretism. Just as children learn within various places and spaces, they also naturally and purposefully combine various ways of knowing within these places. This idea of the natural use of language and the blending of multicultural and multilingual literacy practices in social settings is extended by Gregory, Long and Volk (2004) as they explored the notion of syncreticity, or the ways children transform different cultural practices, languages, and interactions into new spaces. These new spaces allow for the intersecting of practices in ways that support interactions with others. The history of Syncretic Literacy Studies is grounded in the work of anthropologists seeking to explain interactions and changes in religious practices; however, today embodies studies which seek to explain how children blend the uses of various cultural tools and practices (Gregory, et al., 2004). These studies share the basic tenets that children draw on their own unique cultural and linguistic backgrounds and blend, borrow, and apply these tools in new ways as they enter into new social settings within their networks of support.

Networks of support and communities of practice. An additional key tenant Long & Volk (2004, 2010) explored was the many ways in which learners create spaces within complex networks of support. Wenger and others have termed these networks communities of practice (Lave & Wenger, 1991; Wenger, 1998; Wenger, McDermott & Snyder, 2002). These networks consist of the members of the family and community within which children live and learn and whom serve to mediate learning through demonstration, conversation and social interaction that scaffold learners as they experiment, approximate and explore new ways to use language in the world (Cambourne, 2002). While Cambourne's work continues to inform the area of language and literacy, limitations to his study mirror that of other studies in the field due to the limited socioeconomic status of his research subjects.

The culture of childhood. Kincheloe (1997) and Steinberg (1997, 2011) explored the notion that childhood in the 21st century is very different from that of the past. Changes in social and cultural condition call for a new paradigm in understanding the nature of children and childhood. Central to this paradigm is the "effort to make sure children are intimately involved in shaping their social, psychological, and educational lives" (p. 8) and to help children develop a "critical political consciousness" (p. 9). They contend that corporations with intricate marketing ploys have created a veritable market culture, *Kinderculture*, which "commodifies cultural objects and turns them into things to purchase rather than objects to contemplate" (p. 12). They go on to say that "corporate children's culture has replaced schooling as the producer of the central curriculum of childhood" (p. 13).

Additionally, Cannella (1997) called for a deconstruction and reconstruction of the notion of early childhood. She contends that our understanding of child development is grounded in long-held beliefs about the developmental nature of childhood, beliefs that "privilege particular ways of knowing, and actually limit possibilities for younger members of society" (p. 48). As the world of children's play is increasingly mediated within digital environments, it is important to consider the impact pop culture and media have on children and childhood.

Final thoughts on sociocultural theory. Sociocultural theory remains an ever-evolving field that frames research in many disciplines and continues to expand what is known about language and language learners by exploring the social worlds in which individuals live and learn. The field continues to be shaped by individuals who have been willing to go beyond what is currently known by questioning current understandings in order to build new theory. Marsh (2005) contended that the "world of early childhood literacy is in transition" and that "children's developmental journeys are shaped by diverse cultural, social, political and economic contexts and constantly responsive to technological innovations" (p. 237). It is with these diverse contexts in mind that I explored the ways in which a two-year-old, a three-year-old and a five-year old were making meaning through multiple sign systems as they used both print and digital-based materials in their homes and communities.

Semiotics: Children as Meaning Makers in a Codified World

Technological advances have brought about changes in communication practices and redefining what it means to be literate in the 21st century (Coiro, et al., 2008; Fang, 2008; Kress, 1997). The term literacy has expanded beyond the narrow definition of the

ability to read and write and has become synonymous with the concept of competence in the encoding and decoding a range of semiotic discourses such as computer literacy, visual literacy, and media literacy (Marsh, 2005). Navigating these new technologies requires an understanding of other sign systems (Reinking, McKenna, Labbo, & Keiffer, 1998).Therefore, I have examined literature in the field of semiotics to inform my understanding of the way the children made meaning as they read multiple signs within print and digital materials.

Signs and Sign Systems

The formal study of signs and sign systems, semiotics, is relatively young in the history of mankind and has its roots in linguistics, psychology, and anthropology (Colbey, 2004; Wells, 2007). The concept of signs and sign systems is grounded in the discipline of semiotics, the study of meaning (Berghoff, 1998). One of the broadest definitions is that of Umberto Eco (1976) who stated that "semiotics is concerned with everything that can be taken as a sign" (p. 7). Signs are further defined as anything that stands for something to someone and serves to mediate between human meaning makers as well "augment human ability to remember and construct meaning" (Berghoff, 1998, p. 3). Therefore, semiotics involves the study not only of what we refer to as signs in everyday speech, but of anything which stands for something else and takes the form of words, images, sounds, gestures or objects (Wells, 2007).

Beyond alphabetics. Crow (2006) posits that the traditional way in which we view words and images in terms of alphabetics and pictures is inadequate and closes us off to a deeper understanding of the complexities of the signs that exist in our world. As children make meaning in the world, they interpret signs and construct meaning long

before they unlock the secret code found in alphabetics. Such things as store signs, videos, street signs, advertising, digital applications, and product labels all combine visual (and at times verbal) information and are organized by principles of graphic design (Moline, 1995). Support for this comes from the work of Vasquez (2007) as she explored the notion of preschoolers as they engaged in critical literacy discussions around what she termed *everyday texts*, or texts that are a part of a child's everyday life such as product packaging. Vasquez posited, "No text is ever neutral" (p. 7). As I conducted this study, I recognized that print and digital materials that these children engaged with had an intended message and were written from a particular perspective. Likewise, the selection and decision to allow children to engage with certain texts was not always neutral.

Reading the world. We live in a world inundated with visual images encoded with messages. Consequently, it is important that parents and educators teach children to read beyond the printed word. Often these message "position them in ways that offer up ideals for who they can and cannot be in the world today, who they should and should not be, and what they should and should not do or think" (Vasquez, 2007, p. 6). It is also important to recognize and note that not all texts involve phonetics, and that the messages that are being read by young children might not be obvious to even the proficient readers who help young children meditate the world. In addition to print media, the world today is inundated with visual text and consequently, visual literacy is increasingly important to

Being literate today involves increasingly diverse communicative practices, demanding competence in the "encoding and decoding of a range of semiotic discourses such as computer and media literacy" (Marsh, 2005, p. 4). Schools have traditionally honored the written sign system which has often marginalized children who are more

interested in and perhaps better able to express themselves through other sign systems such as art, music, or drama (Berghoff, 1998). Because each sign system holds different potential for meaning making (Eisner, 1994), access to multiple sign systems allows for what Short et al. (1995) referred to as "multiple ways of knowing" (p. 160).

Today, images, gestures, music, animation and other visual symbols are being recognized as important means of communication (Siegel, 2006; Vasquez, 2005). Over the past several decades, there has been an introduction of portable digital technologies and an "increasing image-based use of language and this has led to a growing concern over the literacy practices of our society" (Crow, 2006, p. 19). While media studies such as graphic design and visual communication studies have theory grounded in the work of semiotics (Crow, 2003), there is a trend today to include discussions of sign systems within educational settings (Marsh, 2005; Reinking, et al., 1998; Schmidt & Vandewater, 2008; Wells & Claxton, 2002; Wilber, 2010).

Young Children's Language and Literacy Development

Chomsky (2006) advanced the notion that children are born with a certain innate ability to learn their primary home language. Others suggest that children are not born with an innate knowledge of language, but must acquire it through hearing it modeled and experimenting with it (Ambridge and Levine, 2011; Tomasello, 2009). Researchers might not all agree on how children come to know and use their home language, however, all recognize the foundation of language acquisition in the development of literacy. While learning to speak in a home language may appear to progress naturally as children interact within their lives, learning to read and write in that language does not (Gee, 2004). Learning to read and write in the dominant language of a culture is a

cultural rather than an instructional process (Gee, 2004). In order to better understand how children are using print and digital materials in their lives, it is important to consider how language and literacy are acquired and then to consider how this development may or may not be influenced within digital environments.

Theories of Language Acquisition: An Historical Overview

Lindfors (1987) wrote, "language is inextricably entwined with our mental life – our perceiving, our remembering, our attending, our comprehending, our thinking – in short, all of our attempts to make sense of the world" (p. 8). Language is likewise, inextricably entwined with what it means to be literate, but society has set parameters on that term. It is not enough in our society to merely use language to communicate orally; one must use language within the confines of a society's conventional uses. Historically, in Western cultures, that has meant the ability to read and write (Gee & Hayes, 2011).

There are numerous theories about language acquisition (Bruner, 1983; Chomsky, 2006; Lindfors, 1987; Wells, 1986). Some feel that there is an innate ability to learn language (Chomsky, 2006), while others feel that it is socially constructed and developed through social interactions and a need to act in the world (Bruner, 1983; Lindfors, 1987). Holdaway (1979) posited that children learn their home language without formal instruction and somewhat predictably in stages, beginning with babbling and progressing to single word utterances, and progressing to phrases and then to sentences. Central to this development is engagement with primary caregivers and their interpretation of body language and noises. The meanings attributed to the utterances are culturally bound as caregivers provide culturally appropriate feedback.

The problem with looking into the history of any body of knowledge is in being content to accept current constructs or truths. While Holdaway's work was instrumental in raising awareness of the importance of early interaction in literacy development, limitations are recognized in his work because his research was conducted only with white children of privilege. In fact, many studies conducted in the field of language acquisition and childhood development have been conducted within limited contexts.

Language as a Tool for Thinking

Many theorists have studied the way young children learn language and its use as a tool for thinking and learning. Lindfors (1999) viewed language development as an important part of being human and serving three main purposes and human urges, regardless of the community within which a child develops: "to connect with other, to understand his world, and to reveal himself within it" (p. 2). Much like Lindfors, Bruner (1983) believed that language is learned by using it and is a way of transmitting the culture into which the child is born. Additionally, linguist M.A.K Halliday (1984) was well known for his understanding of how children learn language, learn about language, and learn through language. He proposed that language served certain functions and felt that children were quite adept at determining these functions early on as language users. For the child, language is defined by its uses, something that serves a purpose within their experiences.

Cracking the Code of Reading and Writing

How children move from spoken language to cracking the code of the written sign system to become both readers and writers in the world is the topic of much debate. As children use language and are exposed to print in their world, they begin to take on

concepts about the way print works (often beginning with their own names) and the conventions of the written sign system. Through meaningful engagements with texts and more experts, they begin to read (or decode meaning) by orchestrating the use of semantic, syntactic, and graphophonemic (meaning, structure, and visual) elements of text, and through the process of trying to encode meaning, begin the process of learning to write. Clay reminded us that literacy does not follow a neat, linear path beginning with letters and moving to words and ending with sentences and that the point of entry can be very different for each child (Clay, 1998). Genishi and Dyson (2009) summed up the process nicely as they described how children learn to read and write as a "messy mix of knowledge and know-how" (p. 9).

Perspectives on Children's Literacy Learning

Perspectives on the nature of childhood and children's learning are as varied as the children they seek to describe. Children have been born into family units, learned their home language, and have been apprenticed into the world of work and families since time immemorial. However, over the past one hundred years, several dominant views have emerged regarding how children learn and how to best teach them. Research confirms that children come to know their home language in much the same way with equal success regardless of race, socioeconomic level, or intellectual ability (Bruner, 1983; Chomsky, 2006; Lindfors, 1987; Wells, 1986). Likewise, over the years many researchers attempted to explain why some children meet with success while others do not as they learn to read and write (Bruner, 1983; Cambourne, 2002; Holdaway, 1979). These researchers made valid points about the ways in which children best learn to

encode and decode language, but their research was primarily done with children of the dominant culture.

Marginalization and learning. What these researchers failed to consider was the importance of domination, privilege, and marginalization in language and literacy development. Barbara Rogoff (1990, 2003) and Shirley Brice Heath (1983, 2012) were instrumental in expanding these views to recognize the importance of legitimacy of language and cultural practice in literacy development and success in school. These foundational studies have been followed by a myriad of research that goes beyond and recognizes the cultural nature of learning (Gregory, et al., 2004; Long, 1998; Rowe 1994) and expanded the understanding of the ways in which all children best learn and grow in their literacy development. In recent years, research has focused on literacy as social practice (Barton et al., 2005; Gee, 2004; Street, 1995) and the critical nature of literacy (issues of power and empowerment) (Kincheloe, McLaren & Steinberg, 2012; Vasquez, 2003, 2007; Vasquez & Felderman, 2012).

Additionally, work in the field of English Language Learners (ELL) (Ogulnick, 2000; Van Sluys, 2005) and African American Language (AAL) (Boutte, 2007; Delpit, 1996, 2012; Delpit & Dowdy, 2002; Kinloch, 2012; Ladson-Billings, 1994, 1995) continue to deepen the understanding of how children develop literacy skills and the importance of valuing home and community language models and practices in early learning success. Genishi and Dyson (2009) summarized views projected by many of these language researchers by writing:

> All children learn language, but their learning is cultural and shaped by the socioeconomic, linguistic, and political circumstances in which their lives take shape…Their language in use thus echoes with the human relationships and daily experiences that give their lives meaning…children are not so much little linguists

> as emergent social beings, adapting to, and participating in their cultural worlds. (p. 18)

The problematizing of the bedtime stories. Closely related to the failure of schools to tap into the literate family experiences of all children is the expectation by many teachers that all children come to school with hundreds of hours of side-by-side reading experiences on which to draw. The problem with setting the expectation that all children enter school with these experiences is the deficit mindset that children who might lack these experiences have inferior intellect and abilities. I am aware of this expectation and assumptions because as a former classroom teacher, as a mother, and now as a grandmother, I believed that reading aloud to children would lead my children and my students to literacy. In fact, had I really considered the fact that my own mother read to me regularly as a child, and yet I still had difficulty learning to read, I might have realized the fallacy in my logic.

However, while I do not believe read aloud experiences are a prerequisite for successful entry into literacy, I still believe there are merits to children experiencing books sitting side-by-side with more expert readers engaged in a read aloud experience, as do many others. Noted literacy expert and children's author Mem Fox (2001) posited, "The fire of literacy is created by the emotional sparks between a child, a book, and the person reading" (p. 10). She went on to say, "But if every parent understood the huge educational benefit and intense happiness brought about by reading aloud to their children, and if every parent— and every adult caring for a children—read aloud a minimum of three stories a day to the children in their lives, we could probably wipe out illiteracy within one generation" (p. 12). The benefits of reading aloud to children are advanced by the efforts of organizations such as Reading is Fundamental, the American

Library Association, and the American Pediatric Association and other reading initiatives such as The Dollie Parton Foundation which seek to provide books to the homes of children from birth through the age of five. However, a child's invitation into school-style literacy should not be based on the expectation that they have experienced hundreds of hours of side-by-side reading experiences.

Shared reading and the bedtime story. In addition to the notion that children need hours of side-by-side reading experiences in order to be successful in school is the idea put forth in many schools that if children come lacking those experiences, then teachers can somehow replicate them through the practice of shared reading. This idea was put forth by Holdaway (1979) who acknowledged the influence of home literacies and the importance of the foundational literacy experience of the bedtime story through the practice of the shared book experience. Holdaway questioned why children who learned to speak with relative ease are often faced with problems when they attempted to learn to read and write in conventional school settings. Perhaps unknowingly and unintentionally, this theory fueled the deficit model which assumed that children who had not had these side-by-side experiences needed them and that teachers should provide them. Today, shared reading (the practice of the teacher reading to/with a large group of children) has become considered best practice and a means of closing the achievement gap.

While Holdaway's work was recognized as having limitations because his research was conducted with a narrow sample and has since been greatly expanded on as the value of other home literacies have been explored, his work provided a greater awareness of how the expectations of school-style literacies can influence point of entry

for many children who may have different home literacies from which to draw. I mention him here to draw attention to the way in which the limitation of this particular study might also be interpreted as a narrow representation of the ways in which these young children used print and digital materials within their cultures, but also to consider what might be the 21st century 'bedtime story.'

It is important to recognize that while studies can illuminate important understanding about literacy development, they can potentially conceal other key understandings. The work of other ethnographic researchers have worked to reveal those other key understandings found within the literacy development of traditionally marginalized groups (as discussed previously) and examined what Gee (2011) refers to as the inherent critical nature of language and literacy throughout history.

Dominant views of language learning in early childhood. The dominant views guiding early childhood educators and curriculum are that of assimilation and culturally relevant pedagogy. In the past, schools served society by assimilating children into the "melting pot" and curriculum and the teaching of young children was guided by the work of Piaget's developmentally appropriate practice. Literacy was narrowly defined as the ability to read and write in the conventions of the dominant culture and the instruction designed for the mastery of those conventions was linear and incremental. Unfortunately, this is still the case in many schools today; however, there is a growing trend toward culturally relevant pedagogy (Delpit, 1996, 2012; Delpit & Dowdy, 2002; Gay, 2000; Ladson-Billings 1994). This approach seeks to teach the whole child, building on the home language and culture children bring to school while setting high expectations.

Children have always been multimodal learners engaged in learning language, learning about language, and learning through language (Halliday, 1975). What is unique about language development in the 21st century is that children today live in a global society in which they are interacting with and communicating across cultures and languages. In an ever-changing global society, the assimilation model cannot be the model used to teach young children. What is needed is a multicultural approach that recognizes that culture and play are at the center of the way children learn.

Digital Literacies

I distinctly remember driving down the highway several years ago and seeing the message on a billboard change right before my eyes. Advertisers had developed a new technology as a tool to reach the masses which allowed them to display multiple messages in real time as drivers traveled down a highway at 70 mph. No longer did messages reside static on a flat one-dimensional surface until someone climbed to the top of the billboard and pasted on a new message. That experience was one of many experiences with digital technologies that led me to questions and begin to explore the impact of these tools in the lives of young children. Digital tools have led to innovative practices and opportunities for learning as well as new challenges for parents, caretakers, and educators. To explore this topic as it relates to this study, I examined research in the area of (a) digital literacies and the 21st century learner, (b) critical digital literacies, and (c) challenges to the use of technology in early childhood education.

Digital Literacies and the 21st Century Learner

Society today has become a screen culture in which television, computers, and cell phone screens dominate our lives and the lives of children (Elkind, 2007) leading to

changes in communication practices (Lankshear and Knoble, 2004). This screen dominated world has changed how literacy is defined as well as what it even means to be literate today (Albers, Vasquez, & Harste, 2008; Gee & Hayes, 2011; Lankshear & Knobel, 2006). These changes in literacy practices will ultimately be reflected in how we educate the children of the 21st century. Schools have historically sought to provide our nation with a means of preparing members of our society for full participation in that society (Dewey, 1915). Kress (1997) pointed out that schools must determine what curriculum is needed to be responsive to the short term needs of the current economy and the long-term needs of the future by asking what abilities will be needed when the children entering school today enter the work force. Linda Darling-Hammond (2010) explained, "The new mission of schools is to prepare students to work at jobs that do not yet exist, creating ideas and solutions for products and problems that have not yet been identified using technologies that have not yet been invented" (p. 2).

Technology is a pervasive and integral part of our society today and the ability to use it effectively will obviously be a needed skill set in the future. Students today need both traditional skills and multimodal skill (Leu, 2012; Mietlicki, 2009). The skills needed to succeed in the 21st century, increasingly, rest in the ability of access and use information effectively (Leu, 2012). These skills include such things as: (a) the ability to design and evaluate and improve one's work, (b) solve problems using a variety of tools, (c) collaborate with others, (d) communicate effectively, (e) locate and use information for a variety of purposes and (e) develop new ideas (Darling-Hammond, 2010; Prensky, 2004). And ever increasingly, advances in technology will change the nature of work and

school, “acting as both stimulus for the transformation of literacy and a mechanism for dealing with that transformation” (Reinking, et al., 1998, p. 234).

New communication practices that have come about since the 1980s due to new technologies (Marsh, 2005) and have led to new literacy practices, what Lankshear and Knobel (2004) refer to as *new literacies.* The growing field of new literacies focuses on the ways in which language and literacies are “shaped by the ongoing development of new tools and technologies and their roles in daily life” (Wilbur, 2010, p. 1). Much has been written about new literacies and their impact on literacy development and educational practices (Gee & Hayes, 2011; Leu, Kinzer, Coiro, & Cammack, 2004; Reinking, et al., 1998). While there is growing interest in what these new literacies will mean for very young children and emergent literacy (Marsh, 2005; Vasquez & Felderman, 2012), “little empirical data to support some of the claims made, particularly within the early childhood field” (March, 2005, p. 1). However, it is hard to escape the pervasiveness of technology in society today.

McLuhan (1962) prophetically stated that the electronic age would bring about the kind of powerful change to literacy that the printing press brought to the 14th century. These changes have been taking place over the last half of a century and have simultaneously been changing literacy practices. The introduction of Web 2.0 has led to a much more interactive platform in which users can take a much more active part in the creation of **c**ontent (Churchill, 2008). Gee (2011) posited that this offers the possibility that all individuals can be “both producers (writers) and consumers (readers)” (p. 2). Consequently, this is leading to changes in the way children interact with text and come to understand the world in which they live.

Digital literacy beyond the walls of school. Many literacy leaders contend that children are learning more about literacy outside of school than in school (Gee, 2004; Beers, 2010; Prensky, 2005). The opportunities for students to engage in these new literacies through social media provide new outlets for creativity and literacy leaders are weighing in on the importance of engaging students in these new technologies in order to adequately prepare them for the future (Beers, 2010; Darling-Hammond, 2010; Gee, 2003; Kist, 2005; Marsh, 2005; Vasquez, 2005, 2012). It is clear through the available literature to date, that the use of technology is a field of great interest and is pertinent to what happens in the daily lives of children both in and out of school (Leu, 2004, 2011).

Today, over 50% of children under the age of nine have Internet access and more than 80% of Kindergartners use computers (Meitlicki, 2009). Fang (2007) posited that while it took 75 years for the telephone to reach 50 million users, it took the Internet only five years. Today more than 500 million people are connected to the World Wide Web (Fang, 2007). A study recently released by Common Sense Medias (Lewin, 2011) found that fully half of children under the age of eight have access to mobile devices such as smart phones, iPods, and iPads. The use of blogs, wikis, instant messaging and texting has changed communication practices, and will continue to change the ways we read our worlds. As these communication practices are increasingly modeled by parents of young children, it is only natural for children to want to engage in these practices (Lewin, 2011).

Technology has always been instrumental in changing literacy practices but has rarely been acknowledged as such because "its influence was subliminal" and unquestioned (Reinking, 1998, p. xvi). According to Gee (2011), digital media today offer new possibilities for language users—the possibility to expand the power of oral

and written language, or *power up*, much the way written language enhanced oral language (p. 1). Many changes in technology have happened so rapidly, that there has been little notice of the shift to an increasingly visual literacy landscape (Crow, 2006; Kress, 2003; Lemke, 2006; Reinking, et al., 1998). Today's media involves multiple streams of information, placing new demands on the learner (Leu, et al., 2004). Gee posited that while language has always been a multimodal, "multimodality is more pervasive, diverse, and important today than ever before" (p. 1).

Cognitive learning tools. Digital technologies have traditionally been used as a means of conveying information or tutors for students and have historically shown little or no impact on student learning (Jonassen, 1999), but new technologies have the potential to expand ways of thinking in new and divergent ways (Lankshear & Knobel, 2004). What is needed today is a new way of looking at computers and other emerging technologies as cognitive learning tools (Jonassen, 1999). In this sense, computers are not merely places where information is stored, but rather places where ideas can be generated. Jonassen (1999) posited a model much like the model of literacy learning developed by M.A.K Halliday (1982) in which students learn language, learn through language, and learn about language. He suggested entering into an intellectual partnership with technology, thus learning about technology, learning through technology and learning with technology through engagements that technological tools allow (Jonassen, 1999). Gee (2011) posited that literacy is a tool and, in fact, is technology; however, what really matters is what people do with it. He explained:

> Literacy and digital media can be tools for duping people, controlling them, or supervising them or they can be tools for informing people, liberating them, and giving them a sense of control and self worth…A hammer is designed to be useful and good at certain things, but there is no guarantee it will be used in those ways.

> There are also novel and unexpected uses for hammers. So, too, with literacy. So, too, with digital media. (p. 22)

Critical Digital Literacy

As the lives of children become increasingly inundated with text in digital environments, and as parents are increasingly likely to have their children under the age of eight engaged with these texts (Lewin, 2011), there is a need to turn a critical eye toward these texts and the ways in which children learn about the word and the world (Freire & Macedo, 1987). The notion of parents and early childhood educators critically looking at text does not relate to finding fault with the text as it might imply, but rather, becoming aware of the messages presented through the written word as well as the images and video that often accompany them in today's multi-media world, or what some term critical literacy (Lewison, Flint, & Van Sluys, 2002; Siegel, 2006; Vasquez, 2003, 2004, 2007, 2012).

Vasquez (2005) identified critical literacies as an "ongoing analysis of textual practices" (p. 205), and contended that it is important to begin leading children to be critical consumers of text through purposeful engagements that lead them to a deeper understanding of the message beyond the words. Flint, Van Sluys & Lewison (2003) described critical literacies as that which disrupts the commonplace, interrogates multiple perspectives, focuses on sociopolitical issues, and leads to action in order to promote social justice. Additionally, Vasquez (2005) called for critical literacy pedagogies that "go beyond debates over basic skills and best methodology, but that are informed by observations and analysis of children's participatory engagement with texts." (p. 204).

Challenges to the Use of Technology in Early Childhood

Technology is often viewed as evidence that human beings are moving toward an increasingly more advanced civilization—one in which "knowledge is viewed as accelerated, advanced, and most appropriately ties to technology with the goal of maximizing productivity and efficiency" (Cannella, 1997, p. 24). However, just as Cannella (1997) sought to deconstruct the notion of early childhood within dominant views of early childhood education, there is a body of research that has attempted to deconstruct the discourses on these technologies and their impact on literacy development, warning of the danger of placing too much faith in their effectiveness in the classroom, and most especially during the early childhood years (Healy, 1999; Oppenheimer, 2004; Sobel, 2004; Stoll, 1996).

Additionally, there has been much concern about the negative effects of media use on attention and cognition in young children (Schmidt & Vandewater, 2008; Vandewater, et al., 2007). The researchers found a small positive link between heavy electronic media use and mild attention problems. While the authors reported that video games, interactive websites and multimedia software offer benefits for learning, they state that there is little empirical evidence suggesting an advantage over other forms of instruction. The American Academy of Pediatrics (AAP) recently issued a report reaffirming its long-standing recommendation that children under the age of two have no exposure to electronic media and that exposure could have a negative effect on cognitive development (Brown, et al., 2011). The report further suggested that parents limit screen time for children under the age of eight. Additionally, in the 25th anniversary edition of

The Hurried Child, Dr. David Elkind (2007) warned of the pressures of living in a screen based, digital world and of thinking of children in technical ways.

In a study done by Common Sense Media, it was reported that more and more, parents today are handing their smart phones or iPads to their toddlers, and television viewing has increased with each new generation (Lewin, 2011), leaving less and less time for children to engage in imaginative play (Sobel, 2004). David Elkind (2007) contended that very young children are living in a screen culture that has further divided their attention and ability to make sense of their worlds through their play. While the investigative work of Guernsey (2007) offered some insight into the value of some educational videos and programming, conflicting opinions and a lack of clear guidelines have parents and educators wondering how to best support young learners.

These issues raise both awareness and questions about children growing up in this highly technological world. In a recent presentation at a conference in my state, Leu (2012) suggested that children who come from homes steeped in the language and use of digital technologies may have obvious advantages over their less technologically adept peers. More importantly, children who have opportunities to use technology in creative and divergent ways will have even greater advantages. This digital divide is no longer about access to technology as it was in the past. The new divide is now being called the *app gap*, and goes beyond mere access to technology to involve levels of engagement and perceived functions of technology in home environments (Coiro, et al., 2008; Lewin, 2011). Children who come from homes that perceive technology merely as entertainment might not have the same advantage as that of the child coming from homes that view technology as tools for production, creativity, and thinking.

Parents and Grandparents As Researchers in Literacy Studies

Support for the use of case study involving immediate family members as primary participants comes from a myriad of researchers in the field of language and literacy. Robinson and Turnball (2005) contend that there is a history of early literacy researchers using case study of familiar children as a way of developing theory about language and literacy learning. Examining the historical foundations of parent and grandparent studies informed my thinking about the nature of conducting ethnography with close family members. Additionally, more recent studies have informed my understanding of the way parent and grandparent studies have contributed to the field of language and literacy, as well as to provide me with valuable insights into the challenges and rewards of this kind of research.

An Historical Overview

The work of Jean Piaget (Piaget & Inhelder, 1969), best known for his theory of the stages of child development, was conducted with his three children. It was through this research with his own children that he developed the four-stage model of cognitive development. Piaget believed that children progress through predictable stages of development which he identified as sensori-motor, preoperational, concrete operational and formal operational. Central to his findings was the notion that learners experience disequilibrium as they encounter new information and that learning takes place as the learner seeks equilibrium through accommodation or assimilation. His work has been foundational to many early childhood programs and teacher practice, but has been challenged in many respects as new studies have served to inform the field and because of the narrow cultural contexts in which the work was conducted (Donaldson, 1978;

Canella, 1997). However, it remains an important contribution to the field because it was one of the first studies of its kind to consider the ways in which children think and learn.

Likewise, cognitive psychologist Jerome Bruner (1983) contributed significantly to the field of language and literacy through studies he conducted with his son. His work led to an understanding of the way learners build on previous knowledge as well as how teachers can scaffold learning experiences to provide greater learning opportunities. His work, like the case studies that follow, provides support for the use of case study as a method of qualitative research as well as to provide justification for selecting participants who are closely related to the researcher.

Several early case studies that were instrumental in laying the groundwork for other case study research involved subjects who were closely related to the researcher (Butler, 1975; White, 1956). Both studies used retrospective diaries as a means of data collection. The first book-length study of literacy development was done by Dorothy White (1956). White researched her daughter's interactions with books over a three year period and chronicled her experiences with text through a retrospective diary and laid the foundation for later response to literature research. The key findings from the study provided insight into the importance of family relationships in early literacy development.

Another such study that involved the use of retrospective note taking was done by Dorothy Butler (1975). Butler's study was the first of such studies in which the researcher's grandchild was the primary participant, and in this case, the child was a special needs child that had been diagnosed with, what was called at the time, severe mental retardation. The study involved collaboration between Butler and her daughter,

Patricia Yoeman, as the two chronicled Cushla's engagements with books and her early years of language development. Butler attributed Cushla's remarkable cognitive development to the opportunity her parents afforded her to engage with books in a loving and supporting environment. The research demonstrated the important influence print-based books can have on a child's language development. This study, which was Butler's dissertation study under the guidance of Dr. Marie Clay, was among the first to connect the importance of a child's social environment in their literacy development (Duke & Mallette, 2004).

An additional early study that helped to lay the foundation for parent and grandparent studies was conducted by Glenda Bissex (1980) who studied her son's development as a writer and chronicled that story in *Gyns at Wrk* (1980). This early case study has been instrumental in the growing knowledge base of how children learn to write as well as how they learn to spell conventionally. In addition, through her work, Bissex, the founder of the National Writing Project, has served as an advocate for teacher researchers and has advanced the use of case study as a valid means of methodology in the study of language and literacy.

More Recent Parent and Grandparent Studies

Several other researchers have contributed to the field of language and literacy through the use of case studies in which their children were the primary participants. Rowe (1998) further supported this notion through her case study in which she studied her son's dramatic play. This nine-month ethnography provided additional support for the practice of involving individuals who may be closely related to the researcher within case study research. Her research indicated that there was a direct link between book reading

events and dramatic play and that dramatic play was a very important part of understanding books.

The work of Prisca Martens (1996) provided an in-depth look into the literacy development of her daughter from the age of two through five. A key finding of the research was that young children often view themselves as readers and writers until they are subjected to the narrow definition of literacy by adults at home and at school. Marten's work supported the idea that children develop their own unique understanding of language and literacy through the experiences they have in life and it can be very different from that of adults. Marten's more recent work provides a compilation of parent and grandparent studies that link families and schooling (Kabuto & Martens, 2014).

In addition, the work of David Schwarzer (2001) provided an account of the way his daughter developed literacy in Hebrew, English, and Spanish. This longitudinal case study chronicled her literate life at home, at school, and in her community. Key findings from the study include the importance of schools honoring the home languages children speak, allowing students to speak and write in home languages as they develop proficiency in a new language, and the importance of teachers knowing how to support multiliteracy within their classrooms.

Susi Long (1998, 2004) added to the field of language and literacy through an extensive ethnographic case study in which she examined the way her daughter learned a language and literacy in a new cultural setting. Central to the study was the notion that literacy is culturally bound and constructed. Drawing on home literacy studies and first language acquisition, the study not only provided insights into the way new language learners acquire language, but also into the conditions that allow for all children to

naturally learn language through play in the company of others. This study was also used to write a retrospective piece authored by both researcher (mother) and participant (daughter) about ethics in the study of young children (Long & Long, 2014).

Most recently, I have been influenced by Erin Miller's (2012) study of her three young children's reception and appropriation of messages about race. Having received a major dissertation award, this study adds to a body of work by parent/grandparent researchers that, through its close and careful ethnographic lens, provides important insights for the field of education. Miller's study, like the others mentioned in this review, established the importance and legitimacy of the parent-researcher relationship in the area of language and literacy. At a time in education when what is valued is often quantifiable and what is deemed important is replicable, the use of ethnographic case study focused in home and community settings can expand and at times provide counter narratives to other work.

Conclusion to Chapter Two

Research in the field of language and literacy is vast and continually growing as researchers seek to explore the nature of learners and learning. Just as the question that guides this study is broad, this study was informed by a large body of research in the areas of sociocultural theory, semiotics, language and literacy studies, digital literacies, and parent and grandparent studies. While this literature review merely scratches the surface of the vast amount of information available in the area of literacy development, it does reveal that little is known about how very young children are negotiating the digital landscape in which they live today.

Today, literacy has come to mean more than the ability to encode and decode the written word. As our culture continues to develop new tools for communicating, this definition is expanding. This expanded definition of literacy should lead us to ask new questions about the way we conceptualize literacy learning. Research suggests gaps in the ways very young children are growing into literate beings within digital environments. Looking closely at the way that the three children in this study make meaning through the use of print and digital materials in their worlds will serve to add to the current body of knowledge in field of language and literacy. In the following chapter, I will discuss the methods I used to conduct the study.

CHAPTER THREE

RESEARCH METHODOLOGY

I conducted this study to better understand the literacy practices of young children as they used print and digital materials in their worlds. To do so, I used qualitative methodologies grounded in the tenets of ethnography and case study which enabled me to look at the day-to-day lives of three children ages two, three, and five years old. Data were collected in my home, their homes, and community settings. This chapter describes methodologies used and is organized according to discussions of (a) methodological stance, (b) participants, (c) contexts, (d) data collection, (e) transcription and organization of data, (f) data analysis, (g) trustworthiness and credibility, (h) subjectivity, positionality, and reciprocity, and (h) the timeline for the study.

Methodological Stance

Corbin and Straus (2006) suggest that the selection of a qualitative research design be grounded in "the desire to step beyond the known and enter into the world of participants, to see the world from their perspective and in doing so, make discoveries that will contribute to the development of empirical knowledge" (p. 6). For this reason, I selected a qualitative research design and utilized ethnographic, case study, and participant observation methods which allowed me to "get at the inner experience of the participants, to determine how meanings are formed through and in culture, and to discover rather than test variables" (Corbin & Straus, 2008, p. 12). A discussion of these methods follows.

Ethnography

Historically, the use of ethnographic methods grew out of the field of anthropology. As Western Europeans began to invade other cultures attempting to expand borders and opportunities for trade, there was a need to understand other cultures; although, for many years, such work was invested in perpetuating colonial power structures rather than seeking to understand and value the expertise of those who were under the control of colonial powers (Heath & Street, 2008). Thus, ethnographic inquiry initially grew out of a need to examine social life and chronicle it to be able to have control over it.

As Heath and Street (2008) posited, this early ethnographic work was closely tied to economic and national interests. In the late 19th century, anthropologists began to use the term ethnography to describe "lifeways of particular sets of people who lived in colonial situations around the world" (Erickson, 2011, p. 44). However, early anthropological studies did little to provide deep understanding of other cultures needed to coexist in a rapidly changing world because individuals were often viewed as primitive or savage in need of enculturation (Heath & Street, 2008). It was not until the early 20th century that scholars in North America began to recognize the value of studying other cultures (Heath & Street, 2008).

Within the United States and abroad, the onset of world wars brought with it a need to understand other cultures as well as a call for deeper understanding beyond merely knowing the number of people living in a region or their characteristics, and ethnography provided this by offering "descriptions and analyses of language, life ways, and patterns of beliefs" (Heath & Street, 2008, p. 115). However, analysis rested in

decidedly Western views that often defined *others* in terms of absolute (or Western) truths (Denzin & Lincoln, 2005).

Heath and Street (2008) posited that the 1960s and 70s led to an increased need for "seeing, accepting and learning with and about differences within the U.S. population and in nations around the world" (p. 117). Clair (2003) characterized this as an era of post-colonialism in which the "colonized began speaking for themselves" (p. 13) and ethnography began to look at the ways in which language can create and help to understand culture. Others call this the postmodern (Marshall & Rossman, 2006) or post-positivist periods. Exploring the key characteristics of this philosophical stance sheds light on the methods involved in post-positivist ethnographic research.

While ethnography has gone through many changes throughout its history, key characteristics that have remained; such as that described by Clifford Geertz (1973), who helped to characterize ethnography as narratives that involve thick, rich descriptions and examine the webs of significance in the lives of others. Other characteristics of ethnographic research include the use of both qualitative data such as field notes, interviews, audio, video recording, and surveys. All of which I employed in this study.

Clair (2003) posited that an additional characteristic of postcolonial ethnography is the notion that the *other* cannot be easily defined simply by comparison to one dominant group. Central to this research stance is the notion that the researcher can never be truly objective in his/her interpretation of others and must be willing to question their own biases and recognize the influence of their own lived experiences as they collect and interpret data (Denzin and Lincoln, 2005).

Case Study

I selected methods from case study research because this allowed me to look closely at the individual participants within my study and provided me with data collection methods suited to the nature of my research question. Case study is a qualitative approach in which the researcher looks closely at a single case, multiple cases, or social unit such as a person, group, place, or activity and seeks to understand the factors and processes of meaning making (Genishi & Dyson, 2005).

Characteristics of case study. Yin (2004) defined case study as an empirical study that seeks to understand a real-world phenomenon within its natural context. He goes on to identify both single case and multiple case study as effective methods of making theoretical interpretations and posited that case study can be generalized to theoretical interpretation rather than to generalizations to larger populations as is done in experimental research; thus the goal is to "expand and generalize theories…and not to extrapolate possibilities" (p. 21). Features unique to case study research include such things as close examination of a social phenomenon, multiple data collection methods, and specific methods of data analysis.

Case study in digital environments. Research in the area of digital literacy in early childhood education is a growing field today. Marsh (2005) posited that much of the research in early childhood education is focused on traditional views of emergent literacy and is concerned with such things as "pen, paper, and phonics" (p. 5), or a text-centric view of literacy development. There are, however, growing numbers of researchers who are looking closely at the ways young children's communication practices are changing in digital environments. Support for case studies involving

participants who are closely related to the researcher and investigate the ways in which children are developing literacies within digital environments comes from several lines of research (Marsh, 2005).

One such case study conducted by Robinson and Turnball (2005) investigated the communicative practices of one child (the researchers' godchild) and the ways that she engaged with texts across multiple forms of media such as traditional print books and audio visual text (film, video, and DVD). The authors provided support for the use of case study conducted with children with whom the researcher is familiar. The research indicated that one form of text should not be privileged over another and that both print books and video texts equally provide this one child with a set of communicative assets that support literacy development.

Similarly, Smith (2005) provided an account of an ethnographic case study conducted with her own child. Smith explained that "researchers who study their own children and single case examples derive their strength from context, presenting the natural environment of literacy development and learning" (p. 109). Smith's study was done with her son over a period of one year and investigated the ways one child interacted with CD-ROM storybooks and its impact on his dramatic play. She determined that dramatic play was substantially enhanced by the presence of both traditional and CD-ROM storybooks.

Case study in the field of critical, digital literacy has been greatly informed by Vasquez (2005) who studied the literacy practices of her nephew as he engaged with and subsequently created texts around the characters in the popular culture figures known as *Pokémon*. This study provided additional support for researchers examining the literate

practices of the children in their lives as well as involving learning that takes place beyond traditional school settings. This study not only provided support for the use of participant observation, but also informed my thinking as it related to the highly complex nature of texts today and the need for a critical stance in the examination of print and digital materials.

Participant Observation

Spradley (1980) defines ethnography as "the work of describing a culture" (p. 3) and in doing so, ethnographers deal with "what people do, what people know, and the things people make and use" (p. 5). In order to do this, ethnographers often take on the role of *participant observers* as they seek to understand social phenomena. This will be discussed in more depth as I explain the impact this methodological stance had on my data collection; however, because I was so closely involved with the participants in this study, I felt it was important to examine the nature of participant observation as opposed to normal participation in the lives of my grandchildren. It was important for me to be aware of these distinctions as I attempted to suspend my role as "Nana" to these three children and take on the role of researcher.

In examining the role of the researcher within social situation, Spradley (1980) identifies a distinct difference between being a *normal participant* and a *participant observer*. I entered the field as a participant observer which allowed me to experience the social setting and record my perceptions (Spradley, 1980). The challenge of this form of data collection was that I had to overcome what Spradley termed *selective attention*, or the way we selectively see, hear and notice things within a social setting. This was of particular importance to me as a researcher because I was so familiar with the settings

and the participants. Familiarity often breads complacency and there was no room for that when conducting field research—even (or especially) when the field was my own living room. In retrospect, I am sure there were times that I missed things the children said or did because I was distracted by the demands of keeping the children safe or keeping them entertained. The issue of selective attention was especially pertinent when I observed all three children at the same time. Their interactions were often so spontaneous, that I fear that much was lost in translation as I tried to capture all that the children did and said. However, as a participant observer, I was afforded many unique opportunities to examine the children's uses of print and digital materials.

Participants

The primary participants in this study were my three grandchildren, ages two, three, and five. I selected them as my participants because I had greater access to their day-to-day lives than I would in the lives of other children of the same age and, as a result, was privy to moments far beyond the childcare or school setting. Having access to what the children were doing in multiple settings and on multiple occasions gave me an opportunity to witness the many ways they used the tools of their culture to develop literacy skills and make meaning in the world. I had the opportunity to study and come to understand, in-depth, what these experiences were like for three very young children in the contexts of home and community as well as school and childcare settings. In addition to the children, the parents, specifically, the mothers of the children were informants in the study. Other informants included Aiden's classroom teacher and Makayla's sitter. An overview of participants follows (Table 3.1):

Table 3.1.

Participants in the Study and a Description of Relationships

Participant	**Description of Participant**
Aiden	My grandson who was five at the time of the study (Karen and Jason are his parents)
Madilyn	My granddaughter who was three at the time of the study (Karen and Jason are her parents)
Makayla	My granddaughter who was two at the time of the study (Jenny and Reggie are her parents)
Karen	Aiden's and Madilyn's mother and my daughter-in-law
Jenny	Makayla's mother and my daughter
Debbie	Makayla's babysitter
Dalton	Debbie's son who also helped as Makayla's sitter
Mrs. Skates	Aiden's kindergarten teacher for both four and five-year-old kindergarten

Aiden

At the time of this study, Aiden was an active five-year-old boy who played on a soccer team, loved pirates, and liked to draw. His favorite activity during the study was playing racing games on the iPad. During the year of the study, Aiden attended a 4K-5K combination Montessori class at a public elementary school. His classroom teacher looped with his class and so he had the same teacher in five-year-old kindergarten this school year. According to formative assessments administered by his classroom teacher, he was performing above grade level expectations.

Madilyn

Madilyn is Aiden's younger sister. She turned three years old in August of the data collection period. She liked to be read to and engaged with books readily. Of the three children, Madilyn enjoyed going to the library the most. She loved to be read to and would sit for repeated readings as well as for multiple books. Her favorite characters at the beginning of the study were *Hello Kitty* and *Dora*. She often wanted to engage in the

same activities as her older brother, Aiden, which often led to her developing new digital skills throughout the data collection period.

Makayla

At the time of the study, Makayla had just turned two years old. She easily manipulated objects and held pencils and crayons to scribble. At the beginning of the study, she explored books for extended periods by turning pages, looking at pictures, and babbling as if retelling the story. By the end of the study, her oral language had progressed and she was able to retell events, and tell about important characters in books. She did, however, go through a period that she seemed to lack interest in books because she became very interested in playing applications on the iPad.

Parents

In addition to the three children, the children's mothers served as informants in this study as they engaged in activities with the children and provided information through electronic journaling, observation debriefings, and two formal interviews. The mothers of the children in the study provided insights into the children's uses of print and digital materials through face-to-face conversations, talking on the phone and through occasional electronic journaling on a private wiki and later on a private Facebook page (which both mothers requested because of the difficulty of accessing the wiki via their smart phones). Because the mothers spent much more time with the children than I could, I asked them to tell me or write to me about observations they made about the children as they engaged with print based and digital materials. Since I asked the mothers to participate in this way, a more complete description of them is warranted.

Karen. At the time of the study, my daughter-in-law, Karen, was 32 years old and married to my step-son, Jason. She had her master's degree in human resources and worked for a large cable company in a neighboring city. She had her undergraduate degree in psychology. She had worked in human resources for the previous seven years.

Jenny. At the time of this study, my daughter, Jenny, was 30 years old and married to Makayla's father, Reggie. Jenny was certified in elementary education and taught second grade at a local elementary school. At the time of the study, she had been teaching for eight years. Her first three years she taught fourth grade, and she had taught second grade the previous five years.

Makayla's Sitter

Makayla's sitter also served as an informant. She was a middle-aged, White woman and had been keeping children in her home for many years. I made several informal observations in her home to look for ways that Makayla engaged with print and digital materials, as well as a planned, formal interview. I also included her adult son, Dalton, in the interview because he still lived at home and played a significant role in Makayla's childcare and day-to-day experiences.

Aiden's Teacher

Aiden's classroom teacher also served as an informant in that she shared information about Aiden's literacy development and his progress in his school learning environment through one formal interview and through face-to-face conversations. She was trained as a Montessori teacher and taught a combination four and five-year-old class. At the time of the study, she had been teaching for 21 years and was working on a doctorate in early childhood education.

Other Adults

I recognized that other people in the children's lives played a significant role in their literacy development. The exclusion of these individuals from this study does not mean that I did not recognize and value the relationships and contributions they made in the children's lives. This is particularly true in regards to the children's fathers. I chose not to include the fathers in the interviews due to their work schedules at the time of this study (they both worked third shift and were day sleepers). In addition, other family and friends served to created an intricate web of significance in the lives of these three children (such as other grandparents, great grandparents, friends, and acquaintances); however, for the purpose of this study, I limited the inclusion of those people who interacted with the children during the time that I was with them.

Contexts

There were multiple research sites in this study because I felt that it was important to gather data in settings the children were in on a day-to-day basis. These included my home, the children's homes, church, restaurants, and the public library. There were additional contexts such as in my car, my parents' home, or at the grocery store. These settings were the places that the children engaged in literacy acts such as reading or being read to, talking, playing video games, watching television or DVDs, imaginary play, singing, drawing, and writing.

All of the sites for this research were located in Gaffney, SC. Gaffney is a small town in Cherokee County, which is located in the upstate of South Carolina. According to the US Census Bureau (2010), Cherokee County has a population of 55,000 people. The demographics of the county are as follows: 75% of are White, 20 % are African

American, 3. 7% are Hispanic or Latino, 0.4% American Indian, and 0.6% are of Asian descent. The median household income in the county is $34,132.00.

My Home

The primary location for data collection was my home. My home was located four miles north of Gaffney. The family room was our gathering place and was where I had my television and DVD player. In the den area, I also had a piano, to which the children had access. I had a large storage bin where I kept various toys and books with which the children played when they visited. In the family area, I also had a basket of toys and a variety of educational videos that had been purchased for the children. I had a laptop computer, an iPad, an iPod, and a Nook that I usually kept and used in this room or my bedroom.

An additional site within my home was my office, which was located on the second floor. The children were not allowed upstairs without adult supervision; however, I had a large play table set up in my office that the children played at when I had them for extended periods of time. The table had storage for Lego blocks and the top of the table was painted with roads and trees. The children were able to build structures on the table and engage in other forms of play with trucks and dolls. That area also has various children's books, toys, videos, my desktop computer, and a television with a DVD player and provided an additional context for the children to interact with print and digital materials.

Aiden and Madilyn's Home

Aiden and Madilyn lived several miles south of Gaffney with their mother and father. At the time of the study, Karen's teenaged niece A'ndrea lived with them and

helped with childcare. Their home was a three bedroom, double-wide, manufactured home where they had lived since before the children were born. A'ndrea and Madilyn shared a bedroom. Aiden had his own bedroom and had a television and DVD player. The large family room was the location of the television, DVD player and the video game player (a Wii). They had a large collection of videos for the children. The desktop computer was located in the corner of the family room but did not work at the time of the study. The children had many educational toys such as toy computers, hand-held video games, and they both had a large collection of children's books. Karen owned a laptop as well as an iPad. Both Jason and Karen had iPhones. While I made limited observations within this setting, it provided the context for engagements and activities that Karen discussed with me through conversations and in writing.

Makayla's Home

Makayla's home was located three miles west of the city limits of Gaffney. It is a small, five room home with three bedrooms and one bath. One of the bedrooms was used as a study and was where the desktop computer was located. Makayla was not given access to this room because this is where Jenny fed her cat. The family room was where the television, DVD player and most of Makayla's toys were located. Reggie had a laptop computer that he kept out on the coffee table, and Jenny had a laptop, an iPad and a Nook which were used in this room and in her bedroom. Makayla had a variety of toys with which to play, including a play kitchen, building blocks, an indoor slide and a variety of electronic games. Makayla had her own bedroom where she slept in a youth bed and where her mother kept her collection of children's books.

A Final Consideration on the Home Settings

While I had planned to spend a greater amount of time in the children's homes, the reality of the busy lives of these families often interfered with me collecting data on a regular basis in that context. Both fathers in the study were day sleepers and I did not want to intrude on the limited time the families had together on weekends. After discussing this with the parents, I decided I would make limited observations in the children's homes and depend on the mothers to share observations and insights they noticed in their home setting through conversations and posting in a digital journal through social networking.

The Public Library

The public library in Gaffney was located within five miles of both families involved in this study. I took the children to the library once a week over the summer months (with the exception of when the families were on vacation).The children participated in the summer reading program in which I recorded the titles of books read to or by them. I observed the children as they selected books for check out, played on the literacy computers that were available, and interacted with other children and one another each other in the library setting. The children's section of the library had a large collection of children's books, several fine-motor toys with which the children could play, and two early literacy stations (referred to as *literacy computers* that were preloaded with preschool friendly programs designed for literacy development).

Church

Another setting for data collection was at my church. Aiden and Madilyn did not attend my church, but often attended with me when they stayed overnight on weekends.

Makayla attended with her mother. I included this setting because church was often a setting in which the children engaged in early literacy behaviors (such as turning pages in the hymnal, pretending to sing along to hymns, and writing in the bulletin). It is also a time that Jenny and I often choose to allow the children to play with the iPod or iPad as a way of keeping the children occupied.

Restaurants

Restaurants provided additional contexts for data collection throughout the study. At times I took the children out for lunch, either by myself or accompanied by my husband. At other times, I went out with Jenny and Makayla for lunch. There were also times that both families, and all of the children, joined us for a meal at our home or at a local restaurant. I carried a small notebook in my purse to jot down things the children said or did during meals and I kept my phone with me, which allowed me to photograph or video the children in these settings.

Aiden's School

Aiden attended a full-day combination four and five-year-old Montessori kindergarten program in a public elementary school in Gaffney. The school was a pre-kindergarten through fifth grade public school within Cherokee County and had a population of 391 students. I made one informal observation in the spring, and when school began in the fall, I conducted an interview with Aiden's teacher to discuss his literacy development, observed for one morning and attended an awards day program on an additional day. Her comments about Aiden's literacy development provided valuable insights into Aiden's use of print and digital materials in his school setting as well as his developing self-image as a reader and writer.

The Sitter's Home

Makayla's sitter, Debbie, had taken care of Makayla since she was six-weeks old while Jenny worked throughout the school year. Debbie kept another child Makayla's age as well as several school-aged children in her home. While at Debbie's house, Makayla stayed in the large, family room area where the television was located. The sitter had a selection of toys and books for the children to engage with, as well as a large selection of educational videos. She had a personal computer that she occasionally used while the children were there. Her son, Dalton (who was 19 at the time of the study), had numerous video games that he liked to play. Dalton is still lived at home and interacted with Makayla regularly, so I included him in the interview with Ms. Debbie. Dalton played several musical instruments, including guitar and keyboard, which impacted Makayla's interest in music throughout the study.

Data Collection

Data collection took place over the five-month period in the settings described above and during one-on-one interactions with the children, in pairs, as well as with all three children. Some participant observation sessions involved me in one-on-one observations for three or more hours at a time and observations of two, or all three, of the children for one to two hours at a time. Additionally, there were weeks when the children spent the night with me, which provided extended periods of time for interactions and observations. I created a schedule of planned observations so that the parents would be aware of how often I would make observations. My original data collection plan follows (Table 3.2):

Table 3.2.

Planned Observation and Data Collection Schedule

Setting/Duration	**Aiden (Age 5)**	**Madilyn (age 3)**	**Makayla (age 2)**
My home/ 1-2 hours	Once each week 1-1	Once each week 1-1	Once each week 1-1
My Home/ Overnight	Once each week with Madilyn or 1-1	Once each week with Aiden or 1-1	Once each week 1-1
The Public Library/1 hour each week	Once each week during the summer months	Once each week during the summer months	Once each week during the summer months
Church	Twice a month	Twice a month	Twice a month
Other social settings	At least once a month	At least once a month	At least once a month
School/1hour	Once in the fall	Not attending formal schooling	Not attending formal schooling
Sitter's home/1 hour	NA	NA	Once in spring/three times in fall

Data were collected over a 24 week time period beginning in late May, 2012, and continuing until the end of October, 2012. The majority of data were collected during the months of June, July, and August while I was out of school for the summer. During the summer months, Makayla did not go to her sitter because Jenny was out of school for the summer as well. Data were collected when the children came for visits, overnight stays, trips to the library, or other times such as when we went out for meals with the families. Once school began in August, I did not have as many opportunities to make observations throughout the week, but I continued to see the children on weekends when they came to my home for overnight visits, we went out to dinner together, attended church, or went to the library.

When I began tabulating the actual times I observed the children, I found it difficult to quantify the actual moments spent in data collection with the individual

children because many weekend visits involved multiple data collection opportunities over extended amounts of time. Therefore, rather than enumerating all the data points I had on each of the children, I decided to examine the frequency of data collection (including interviews, observations/note taking/ photographing and video-taping) based on the months in which data were collected. This provided a clearer picture of the frequency of data collection in the first phase of the study (when the children and I were out of school from May-August) and the second phase (after Aiden, Jenny, and I returned to school and Makayla returned to the sitter from August-October). The frequency by months is described in table 3.3.

Throughout the data collection period, I made observations in each research setting in order to provide extensive descriptive perspectives that allowed me to construct variables as opposed to testing them (Straus & Corbin, 2008). As a participant observer, I engaged in an ongoing cycle of asking questions, gathering data, ongoing reflection on the data in search of patterns and themes, interpretation, and asking new questions which emerged and lead to further inquiry. Data collection methods I used included (a) field notes, (b) video recording, (c) audio recording, (d) photography (e) surveys and inventories, (f) interview (both formal and informal, (g) journaling by the mothers, and (h) formal and informal assessments.

Table 3.3.

Frequency of Data Collection over the Five Month Study

Setting	Late May-June	July	August	September	October	Total
My home	14	18	10	4	5	51
The Parent's Home *(in person)	2	3	2	0	0	7
The Public Library	3	4	4	2	2	15
Church	2	2	2	1	1	8
Restaurants/Stores	6	5	3	2	2	18
The Sitter	3	0	1	2	1	7
Aiden's School	1	0	0	2	0	3
Other contexts such as my car, my parent's home	4	4	1	1	0	10
Total	35	36	23	14	11	119
*Note: additional opportunities for data collection occurred during personal conversations, phone conversations with parents and through social networking.						

Field Notes

Field notes provided me a rich source of data and were used for analysis throughout the data collection process. As suggested by Corbin & Strauss, 2008), I often used them to ask additional questions, generate reflective notes, define new terminology, or to look for emerging themes in the data. My field notes were taken in a variety of print and digital formats. At times, field notes were taken in a notepad I carried with me as well as electronically on my iPad or laptop computer. I tried to make it a habit to make daily entries in a handwritten double entry journal or to write electronic notes and email

them to myself. At other times, I quickly jotted something down on a napkin or a children's menu in a restaurant.

Double entry journal. I used a *double entry journal* for field notes. This provided space for observation notes as well as my comments and reflections as participant observer. In the margins, I tried to include a reference to other data collection methods, such as photographs and video taken at the time of the observations. This allowed me to record moments in the observational experiences that I wanted to focus on in particular when I reviewed, transcribed, and analyzed the audio and video data. In this way, field notes served as a back-up to, as well as an extension of, other data methods such as photographing the children's engagements or video recordings. I kept notes on one side of the journal, and wrote reflections or notes and early coding on the right.

I also used field notes as a way of reflecting on the observations and began preliminary data analysis through open coding within the margins. An example of this was when I wrote about an observation that I made of Aiden as he listened to an eBook read aloud to him. After recording the notes about Aiden as he listened to this book, Aiden responded by saying, "That was good." I wrote in the margin of my notes: *Digital read aloud- opportunities for interaction. Read to me feature might limit interaction*. I then added *Reader Response*. This early coding was my way of trying to make sense out of the observations I had written in my field notes. While at times, my notes looked like scribbles as I tried to capture a thought as Makayla tried to wrestle the pen from my hand, they served a valuable purpose in my data collection process. As I became more familiar with the use of ATLASti for uploading data, writing memos, and reflecting, I neglected to write in my double entry journal because I felt as if I was duplicating my data

collection efforts. In retrospect, I should have maintained my handwritten journal throughout the data collection period because it provided me the opportunity to reflect about the data differently than I did when I used electronic means to record field notes.

Electronic field notes. While I had planned on using digital tools as a means of data collection, this proved to be a challenge during the actual observations times because the children were so interested in any use of digital tools. If I opened my laptop and began to take notes, the children would often stop what they had been doing and come to the computer in an attempt to see what I was doing. However, I did utilize several applications following observations. I used the applications *Noteability* and *Evernote.* I often made notes to myself in *Evernote* as I reflected on observations and emailed the notes to myself to print and add to my handwritten field notes (Figure 3.1)

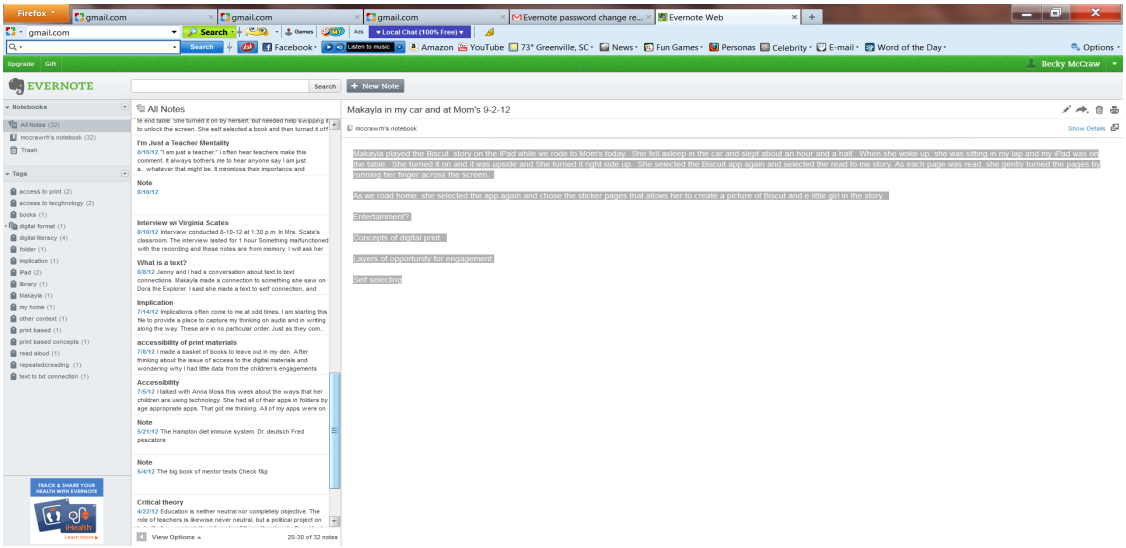

Figure 3.1. A screen shot of a page in my *Evernote* application

These notes were then sent to my email box and saved as Microsoft Word Documents. These were often brief notes but helped me capture a literacy events observed in various settings. These emailed notes were then incorporated as memos into the

electronic data collection and analysis tool (ATLAS.ti) that I used for this study. When it was not possible for me to record information electronically (such as during church or while at a restaurants), I kept a small pad with me for more impromptu, hand written note taking.

Video Recordings

Video recording the children proved to be the most challenging form of the data collection methods I used in the study. The mere presence of the tripod or the act of me holding the camera up for a period longer than that required to take a photograph usually resulted in the children coming to see what I was doing, which ended whatever literacy event in which they might have been engaged at the time. In response to this, I got in the habit of catching snippets rather than leaving the video camera going for long periods of time. In retrospect, capturing their curiosity about the camera was, in fact, a kind of literacy event as they were seeking to understand just how the equipment captured their images and actions. In spite of these challenges, I made numerous video recordings of the children engaged in literacy events throughout the data collection period.

Since my grandchildren did not live with me, I also asked the mothers to periodically photograph or video the children while they are engaged imaginative play, writing, drawing, book reading, playing video games, or while using other electronic media. I was not there each night when the children are read to before they were put to bed or while they watched their parents search for a product online. Each family had access to a flip camera, tripod, and periodically captured activities that they thought might be important in the literacy development of their children. I did not want to intrude on their

privacy or take away in any way from valuable time spent together as a family; therefore, I limited the number of times I asked the families to do this over the course of the study.

Audio Recordings

I used audio recordings for the interviews I conducted. I used my iPad to record these interviews using an application called *Notability* (Ginger Labs, 2012), which allowed me to make a digital recording of the interview as well as to type interpretive notes to accompany the audio file. Because of my previous experience with the temporal nature of digital files, I backed these files up by using a cassette recorder and cassette tapes. I only used audio recordings for the interviews. In retrospect, I regret that I did not capture more of what the children were doing and saying through audio recordings. I say this because of the challenges I faced in trying to use video recordings with the children.

Photography

Hamilton (2003) posited that photographs could be extremely useful in capturing literacy events. In fact, taking photographs of the children engaged in literacy events proved to be the most effective data collection method for me. What resulted from the extensive number of photographs I took over the course of the study was a photo montage of their literacy practices. These events could be examined as Hamilton (2003) suggested in terms of participants, setting, artifacts, and activities. Taking photographs also proved the least invasive form of data collection and the least distracting for the children. The children were accustomed to having their pictures taken and did not seem to be distracted by the use of a camera. However, when that same camera was put on a tripod for video-taping for extended periods, the reaction was much different.

Surveys and Inventories

Making an inventory of available print and digital-based materials in my own home was the first step to identifying the kinds of materials with which the children might engage throughout the study. This required me to consider the accessibility of the available materials with which they might engage on a regular basis. I began by listing the things I noticed in my own home setting and then considered the kinds of materials with which the children could engage while in the other observation settings. Some of these materials included such things as books, magazines, newspapers, product labels, signs and advertisement, and electronics such as computers, phones, and electronic readers (eReader).

After completing an inventory of my home setting and considering the kinds of materials with which the children might engage in other settings, I wanted to know exactly what the children had access to in their home settings. To gather these data, and because I felt that it might be intrusive for me to inventory the print and digital based materials found in the homes of my daughter and daughter-in-law, I developed a brief questionnaire for the parents to complete prior to the initial interview (Appendix B). The questionnaire required parents to reflect on the available materials in their homes. I gave the survey to the families one week prior to the initial interview and asked that they complete it within one week and return it to me at the time of the initial interview. I felt that giving the families the questionnaire prior to the interview allowed them time to reflect on the available print and digital materials they had in their homes and made it possible for them to provide more informed answers to the interview questions. A summary of the inventory of materials found in the primary data collection sites follows (Table 3.4):

Table 3.4.

Inventory of Available Materials

Materials Available	My Home	Aiden and Madilyn's Home	Makayla's Home
Children's Books	√/50+	√/50+	√/ 50+
Desk Top Computer	√/1	√/ 1 not working at the time of the study	√/1 not accessible to Makayla
Laptop computer	√2	√/1	√/1
Newspapers	√	NA	NA
eReader (Nook, Kindle, other)	√/2	√/1	√/1
iPad/iPod	√/2	√/1	√/1
Smart Phone	√/1	√/2	√/2
Television	√/4	Not noted	Not noted
Electronic toys	√	√	√
Other materials listed	Mail	Blogs Websites	Websites

Interviews

Another important data collection method I used was interviews. I conducted formal interviews with the mothers of the participants as well as with Aiden's teacher and Makayla's sitter. These interviews were formal in the sense that they were planned and involved a set of prepared questions that served as framework for the conversations but allowed for impromptu responses and additional questioning. These interviews were audio recorded and then transcribed for analysis. The need for informal interviews arose at times throughout the data collection process and throughout ongoing analysis. These were often impromptu conversations that took place in person, on the phone, or through social media.

Parent interviews. I conducted a formal pre- and post- interview with Karen and Jenny. I purposely designed questions to be open-ended enough to allow participants to take the conversation where it naturally led in hopes that this would enrich the interview process and the quality of responses. I provided the parents with a copy of the interview questions prior to the initial interview. The initial formal interviews were conducted in different settings that were selected by the families. I interviewed Jenny in her second

grade classroom and interviewed Karen at a local park. Some of the questions I asked included:

- What kinds of print material do you have in your home?
- What kinds of electronic materials do you have in your home?
- Do you read aloud to your child/children, and if so, where, when, and how often?

While I had planned to interview both parents together as a family unit without the children present, the realities of day-to-day life led me to interview the mothers (on separate occasions) while the fathers provided childcare. In retrospect, I should have also conducted interviews with the fathers at another time because I inadvertently excluded them from the foci of the study by choosing to leave them out of the initial interview.

Teacher interview. I also developed interview questions for Aiden's kindergarten teacher. My reason for including Aiden's teacher stemmed from my concern and desire that the developing literacies that my grandchildren took to school would be valued and built upon as they continued to grow in their literacy development. Therefore, I purposely planned open-ended questions that would allow the teacher to describe her program and how she was actively supporting Aiden's emergent literacy within her classroom. I provided her with a copy of the questions prior to the interview. Some of the questions I asked included:

- How do you define literacy?
- What are Aiden's greatest strengths as a literacy learner?
- What kinds of digital-based materials does Aiden use while at school?

The interview with Aiden's teacher provided new insights into Aiden's use of print and digital-based materials both in and out of school.

Sitter interview. In addition to the parents and Aiden's classroom teacher, I interviewed Makayla's sitter. Throughout the school year, Makayla spent more waking hours each day with her sitter than she did with her own mother. The kinds of conversations and activities in which she engaged had the potential to have a profound impact on her language and literacy development. Questions I asked included:

- What is Makayla's favorite thing to do at your house?
- Do you to read books to her?
- What kinds of toys does Makayla play with during the day?

I selected Makayla's sitter as an interviewee because she had many years of experience in providing child care. I did not choose to interview Madilyn's child care providers because they were informal and much more impromptu depending on the needs of the family due to Jason' work schedule. In retrospect, I should have interviewed Jason and A'ndrea who provided childcare for Aiden and Madilyn throughout the summer months and Karen's sister who was Madilyn's sitter once school began for Aiden. These perspectives would have yielded additional data that would have informed the study.

Exit interviews. I conducted exit interviews with the mothers of the participants following the data collection period. The questions that I asked during these separate interviews emerged from the data and the need to clarify perspectives, member check, or further explore certain patterns in the data. Additionally, the exit interviews provided a forum for the mothers to share their feelings about the research as well as insights they had gained about literacy development and the uses of print and digital materials in

learning environments. The exit interview also gave the parents an opportunity to ask questions and share new insights they had due to their participation in the study.

Electronic Journaling by Karen and Jenny

During the data collection period, I asked the mothers to journal about the ways the children were using print and digital materials in their own homes. I purposefully did not include the fathers in the journaling process for several reasons. First, and foremost, was the fact that both fathers worked third shift and slept during the day or evening hours. Additionally, Reggie was attending night school in order to receive his bachelor's degree. I felt that asking either of the fathers to journal about their children's literacy development would require too great of a demand on the limited time they had with their families during evenings and weekends.

The journaling done by the mothers was in the form of a dialogue journal (first, through a secure wiki space online and later, per the request of the mothers, within a secure Facebook page) in which the parents reflected on the children's uses of print and digital materials. The Facebook page that I started for each mother was private and only the mother and I had access to the posts, photographs, videos, and comments. Throughout the data collection period, we posted photographs and pictures and they occasionally engaged in written conversations with me. While in theory this was an excellent way for me to gather data in the children's homes without invading the privacy of the families, the mothers did not participate as often as I would have liked. My needling Jenny to post a picture or video did not seem to encourage her to participate more actively in my data collection. At one point I even commented on a conversation thread with Jenny that perhaps I had closed down the conversations with my own responses. She responded by

telling me she just was often too busy to remember to post anything. While this data collection method did not yield the copious amounts of data that I had hoped, it did allow the mothers to reflect on the children's literacy experiences while in their own homes as they posted several videos of them reading aloud to the children as well as occasional photographs and comment. At times, this social networking site even served as a quick way for me to let the mothers know that I would be picking the children up for a trip to the library. A screen shot of part of the Karen's private Facebook page follows (Figure 3.2):

Figure 3.2. A Facebook conversation thread between Karen and me

Formal and Informal Assessments

Data were also collected using both informal and formal assessments of the children's knowledge of concepts about print and digital media. These concepts of print included such things as directionality, return sweep, the knowledge that letters go

together to form words, and that words have meaning. Informal assessments included observations of the kinds of skills needed to engage with books in print and digital formats, noting how children wrote in different settings, and how they were acquiring digital skills through their play.

I limited the administration of formal assessments to Aiden because I felt that formal assessments of Madilyn and Makayla were not age appropriate and that their limited oral language development might influence the results. I administered a formal inventory of concepts of print (DeFord, 2000) to Aiden at the beginning of the study. Out of a possible 17 measures of concepts of print, Aiden scored 17. This indicated that he had developed a strong understanding of the concepts of print materials. I also used formal assessments to measure Aiden's knowledge of sight words and his reading of connected text. Throughout the study, I made anecdotal notes of the kinds of concepts Madilyn and Makayla were exhibiting through their book handling and uses of digital tools.

Transcription and Organization of Data

Organization and management of data was a challenge due the large number observations notes, photographs, and videos I made throughout the five months of the study. However, the use of a computer-based qualitative research program (ATLASti) for storing and cataloging these data facilitated the process. The discussion of this process follows.

Transcription of Data

Many researchers employ transcribers to assist in the necessary step of transcribing prior to formal analysis of data; however, I felt that there was value in going

through the process and reliving the experiences by doing the transcription myself. As I transcribed the audio and video recordings, I used a foot pedal that allowed me to start and stop the recording and play back so that I was able to capture the interviews and engagements. When transcribing audio files (the interviews), I keyed the transcription directly into a table I had created on my computer. The table had a column for my questions and comment, a column for the interviewee's answers and comments, and an open field that allowed me to do open coding and reflect on the data. This process of transcription proved to be most valuable not only as a tool for analysis of the data, but also as a tool for self-reflection that ultimately led to additional findings. An example of an excerpt from the initial interview with Jenny follows (Table 3.5)

Table 3.5

Excerpt of Initial Interview with Jenny

QUESTION	RESPONSE	NOTES/ POTENTIAL THEMES
Which of these materials does Makayla have access to on a regular basis?	All of them. Because she has her own sets of papers that she can shuffle and enjoy herself, other than of course her children's books. Which she has a large library of children's books, also.	Parents provide access to print materials based on their choices and financial ability to provide those materials. Jenny lets Makayla engage in imaginary play with the same kinds of materials that she uses (school papers, etc.).
Describe the kinds of electronic digital equipment you have in your home.	We have a personal computer, a laptop, two smart phones, an iPad, and eReader, a Nook Color, and she has access to DVD players that of course play different types of educational videos that have print on them.	Just as in the survey of materials, she did not refer to the television as a form of electronic or digital equipment. Television is an invisible entity within their lives.

For the transcription I did from digital video recordings, I utilized *Express Scribe* (NCH Software), an electronic transcription tool. The software allowed me to create transcriptions from audio and video files by typing along with the playback. This tool

was compatible with ATLAS.ti, the qualitative data organization and analysis software program that I used for this study, but did not directly interface with ATLASti. I had to transcribe within *Express Scribe* and then upload to the ATLASti program. Due to the size of many of the videos, I selectively added videos to ATLASti and often printed hard copies of the transcriptions to hand code and reflect on the data (Figure 3.3). This often provided me valuable insights as I analyzed the transcriptions for additional patterns and themes.

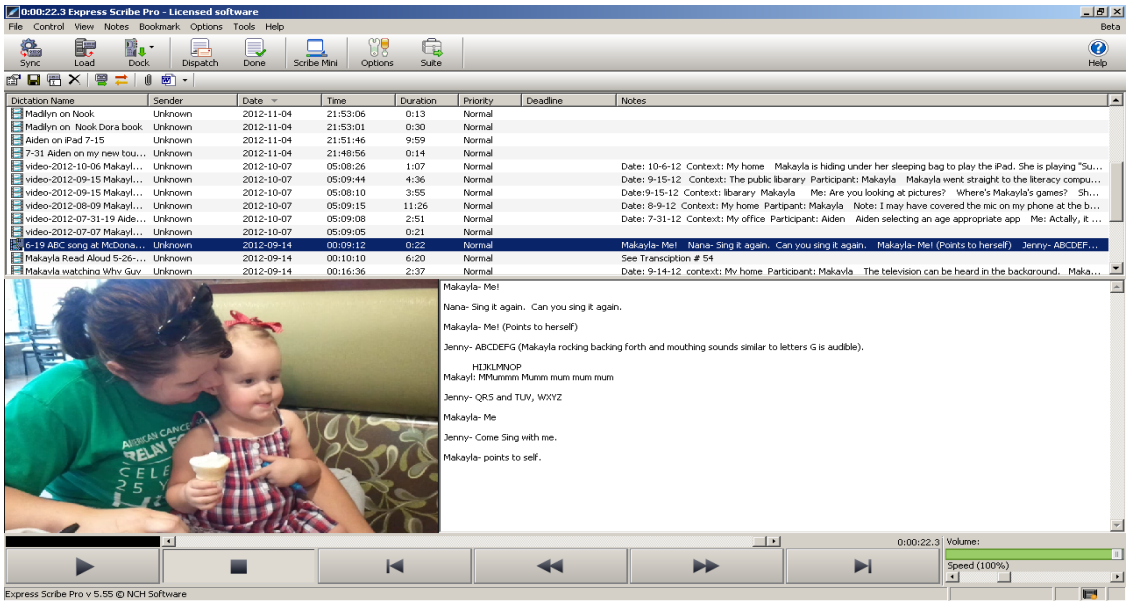

Figure 3.3. A screen shot of one of the transcriptions in *Express Scribe*.

I transcribed selectively, leaving out parts of the video that I did not feel provided needed data. I chose to then copy and paste the transcription into a table that I created on my computer and then hand coded by highlighting, underlining and commenting on the transcription. This allowed me to reflect on the conversation such as pauses and redirections as well to code the transcriptions before uploading them into ATLASti.

Organization of Data

The challenge of taking field notes and video-taping in multiple contexts is in managing the volume of data produced and in making and taking time each day to reflect on what was observed (Hubbard & Power, 2003). Throughout this study, field notes were at times written by hand in a small journal and at other times recorded electronically within a word processing program. Photographs and video were taken with a digital camera and a smart phone and uploaded to ATLASti, the qualitative data management software package used for this study. Early in the study, I attempted to catalog the different photographs and video recordings made within a table I created on the computer, but abandoned the effort when I found it to be overwhelming and a duplication of other data collection methods. This early attempt can be seen in Table 3.6. In retrospect, this would have been an excellent way to maintain a log of the data I was uploading into ATLASti throughout the data collection period.

Table 3.6.

Early Attempt to Catalog Data

Date	Context	Data Collected	Observation	Notes and Reflections	Coding
5-26-2012	Jenny's House	See field notes	When entering Jenny's house, I noticed the magnetic letters on the refrigerator. Jenny has placed magnetic letters on the front of refrigerator for Makayla to play with. 	I recall Makayla running to the letters when my husband came in the door and grabbing a random letter and saying "e"!	
5-26-2012	Jenny's home 8:30 p.m.	Photograph of Jenny reading to Makayla (*Chicka Chicka Boom Boom*) See Field notes		She sits in Jenny's lap during the read aloud and turns the pages for her mother. She points to letters on the page.	

Transcriptions were saved in digital files within the ATLASti program. Initial coding was done within the table created for the transcriptions and additional coding was done within the data analysis program after uploading to ATLASti (Figure 3.4).

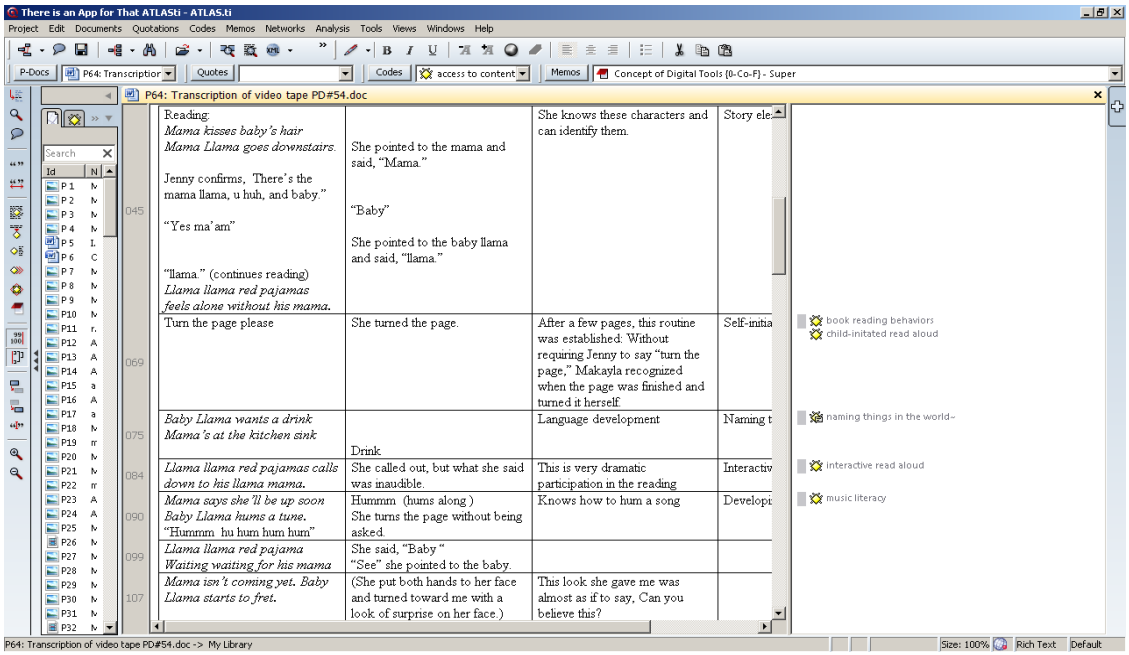

Figure 3.4. Organization of data within ATLASti

Data Analysis

In developing my analytical techniques, I drew on the work of researchers who suggest that data analysis is not an emergence of findings but an intentional construction of findings by the researcher (Grbich, 2007). This occurred as I reflected on data throughout the course of the study as well as in a formal review after all data were collected. Throughout the data collection process I engaged in constant comparative analysis as I sought to identify key concepts and continually compared specific incidents within the data to glean insights. While analysis began with the first observation I made, there were distinct differences in the ways I analyzed along the way and the way I analyzed once I had ended data collection.

Preliminary Analysis

Preliminary analysis began with the first interviews and observations. This was an ongoing process in which I engaged each time data were collected. As I uploaded photographs, videos and other primary documents into ATLASti, I reflected on the data and coded it based on my reflection and impressions. I used open coding by employing the analytic tools of constructing patterns from careful readings of the data and using strategies such as questioning the data (using my research question and key ideas that emerged in the course of data collection. While I accomplished some of this coding through analysis of hard copies of transcripts and memos I had written, a great deal of the early analysis and coding were entered directly into ATLASti. Many of these early codes were similar or synonymous and were later collapsed into what became major or key codes within the data and are reflected below (Table 3.7)

Table 3.7

Frequencies and Contexts of Codes Pursued

Early Codes Pursued	Home	Restaurants	Church	Public Library
Access to content/devices	15	6	1	2
Adults as gatekeepers	22	6	1	3
Apprentice	16	3	1	9
Concepts of print/reading behavior	28	4	2	9
Digital concepts/skills	45	6	2	12
Digital entertainment/play	38	8	4	11
Emotional Reaction	10	0	0	3
Digital Stare	8	8	4	1
Expert other	20	3	1	8
Imitating/emulating	20	4	1	4
Multitasking	6	1	2	0
Parent pride	5	0	0	3
Pop culture	24	3	0	5
Rewards	9	0	0	5
Read aloud	16	0	0	7
Self-selected digital texts	17	11	4	8
Transmediation/transfer	12	2	0	2
Writing behavior	20	5	2	2

These early codes were based on my reflections of the data, and through the use of the ATLASti program, I was able to pinpoint locations within the data that led me to identify certain codes. The program allowed for the marking of the precise place in the primary document (photograph, video, or interview transcript) to which the code applied and marked the location with a box and an assigned number for the code so that one primary document could be coded with multiple codes such as the photograph of Makayla reading at the library (Figure 3.5).

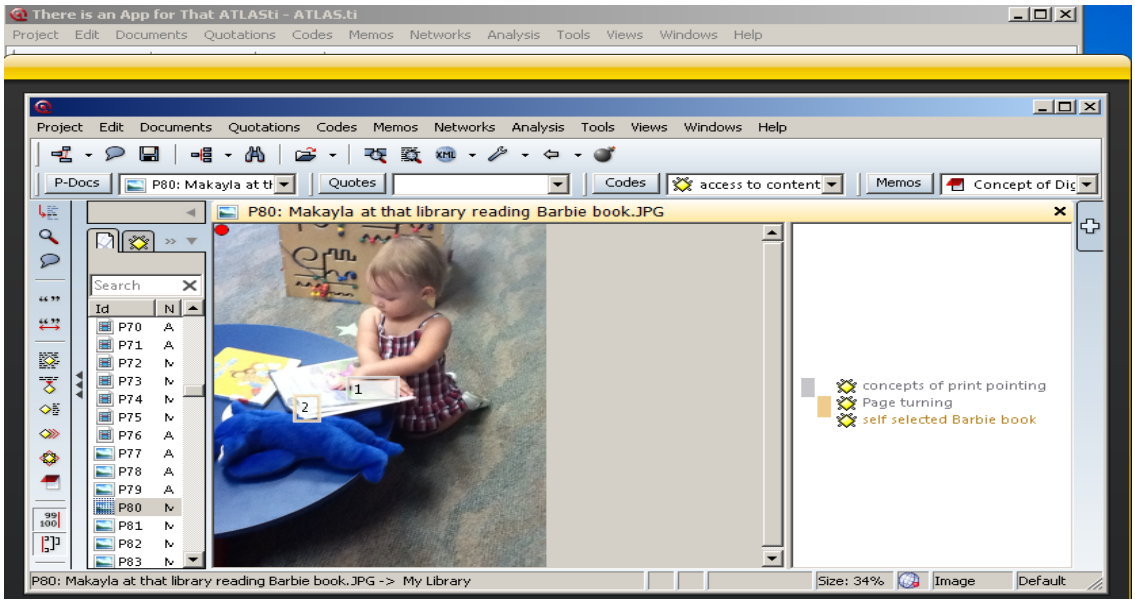

Figure 3.5. A screen shot of early coding in ATLASti

Throughout the data collection process, I also wrote memos within the ATLASti program as a form of preliminary data analysis in order to capture insights, ask questions of the data, and reflect on emerging patterns and themes in the data. These memos often led me to modify my data collection practices, have informal conversations with the parents, or refine my coding process through more precise descriptions of the data.

Post Data Collection Analysis

Post data collection analysis involved examining the primary documents that I had coded throughout the process of data collection more deeply through grouping data into categories and looking for emerging themes. I began this process by: (a) presenting preliminary findings at a national convention, (b) utilizing tools in the computerized qualitative data program (ATLASti), (c) writing about insights, and (d) reading beyond in the literature.

Presenting preliminary findings. Following the data collection period, I synthesized preliminary analysis into preliminary findings as I presented at the 2012 National Council of Teachers of English convention with other early childhood educators. In many ways the process of sharing some of my preliminary insights through this presentation required me to begin to organize what had been broad patterns that I saw recurring in the data into more cohesive themes. Much of what I shared in that presentation was really raw data, but the act of sharing some of the photographs and video clips led me to deeper understandings of the data and required that I name and begin to support those findings with evidence from the data. Those preliminary insights became the foundation of findings statements which were refined through additional analysis and through the writing of those findings.

Computer assisted data analysis. For this study, I used ATLAS.ti, an electronic ethnographic data collections and analysis program. This program proved to be a way of managing the large amount of data I collected over the five months of the study and also facilitated data analysis. This computer program provided the means to generate lists of

the open coding I had done throughout the study so that I could look for patterns and themes within the primary documents.

Actually, I am sure that this computer program could do much more than I knew to ask it to do. What it provided me more than anything was a very efficient way to store and code the primary documents collected during the five months that I collected copious amount of data on the three children as they used print and digital materials. Although this computer-based program provided a valuable tool for collecting and analyzing the data, I had to do more than input the primary documents into the program to glean the findings from the data. In examining these early codes, it is apparent, that a great deal of my analysis occurred as a result of reexamining the initial surface level coding. For example, the initial analysis of the photograph in Figure 3.5 did not include codes for *apprentice* and *expert*, but deeper analysis of the photograph along with reexamining field notes led me to recognize that Makayla was emulating the reading behaviors of girl whom she did not know; therefore, acting in the apprentice role to this more expert reader.

Additionally, the code of *parental pride* was not coded frequently in the initial coding, but reflecting on this code led me to begin to more closely examine the role of adults in children's literacy lives. In fact, most of the analysis about the adults as well as the analysis concerning the lack of diversity and gender bias in the materials I provided the children took place after the data collection period. While this analysis is not reflected in the coding chart above, the early coding provided the impetus for deeper analysis of the data as I looked beyond my initial interpretation and gleaned key insights from the data. These key insights were later collapsed to reflect the final findings.

Writing as a means of data analysis. Throughout the data collection and analysis process, writing was my primary tool of analysis. I remember thinking that my analysis should have been complete when I first sat at my keyboard to begin writing findings statements and as I supported those statements through the data stories I shared. What I found was that as I wrote and received feedback, I began to see nuances in the data that I had missed in preliminary coding and analysis. These findings were recorded in a chart further reorganized and collapsed into findings within the broader categories of insights about (a) print and digital materials, (b) transactions with print and digital materials, and (c) adult roles in the literacy development of young children and the impact of the study. As I rewrote finding statements to more clearly define what the data supported, I collapsed some early finding statements, abandoned some as insignificant, and discovered additional findings, particularly as they related to the way adults in the study viewed print and digital materials as well as racial and gender bias in the materials that I had provided the children. It was through the process of transcribing, analyzing, reflecting, and writing, that my findings were constructed.

Reading beyond to inform analysis. One additional means that I employed in post data analysis was reading beyond my current constructs. Bogdan and Bilken (1992) suggest that exploring the literature in the area of study can add to the analysis process by stimulating new ways of thinking. As patterns emerged in the data, I realized that I needed additional reading in various areas of study to begin to fully understand the ways the children were using print and digital materials. I did additional reading in the area of critical sociocultural theory and explored the idea of literacy events and literacy practices more extensively. I read more about the critical nature of technology and additional

reading informed my thinking as I considered my pro-print bias and the evidence of cultural and gender bias in the materials I made available to the children. These areas in which I read beyond my current constructs will be discussed in greater detail in the findings and implications chapters.

Trustworthiness and Credibility

I took several steps to build trustworthiness and credibility into the study through my research design. This was accomplished through (a) the use of prolonged observation in multiple contexts, (b) the triangulation of data, and (c) the use of member checking (Lincoln & Guba, 1985; Marshal & Rossman, 2006).

Prolonged Observation

This study took place over a five month period of time which provided for prolonged observation of the three children within a variety of contexts. Observations were made multiple times each week. Many times the children stayed with me in my home for several days, which provided many opportunities for observations over prolonged periods of time. Prolonged observation allowed for multiple opportunities for collecting a variety of data as the children engaged in the uses of print and digital materials in a variety of contexts.

Multiple Means of Data Collection

Throughout the study, a variety of data were collected on the three children and the adult participants who also served as informants. Data collection included the use of audio and video recordings, observation notes, photography, survey, and interviews and took place in a variety of contexts. The triangulation of the data provided multiple windows into examining the children's uses of print and digital materials.

Member checking

Throughout the study, I employed the use of member checking, or checking back with participants to understand their perspectives about my interpretations of data. To do this, I collaborated with both mothers through face-to-face conversations, phone calls, and through social networking. I did this by calling the parents on the phone, texting, or talking with them informally when we met for dinner. I also shared the transcripts of the interviews and discussed interpretations of transcripts (data analysis) for the adult informants to solicit their perspectives about my interpretations and representations. Following the completion of my findings chapters, I had a final member check with each of the mothers to discuss the findings and how the study had impacted their own learning, which will be explored in greater detail in the findings chapters.

I did conduct some member checking meetings with Aiden as I asked him questions throughout the study; however, I did not include the children in member checking as often as I might have. I often directed my questions to the mothers rather than the children. In retrospect, the children might have been able to offer additional insights into their actions, decisions, and preferences about the print and digital materials they used.

Subjectivity, Positionality, and Reciprocity

My beliefs positioned me to impact how I viewed the phenomena observed, recorded, analyzed, and represented data collected in this study. Just as my beliefs influenced my research interest as well as my selection of research methodology, they influenced the way I interpreted the data I collected. As I considered issues of subjectivity and positionality, I considered (a) my relationship with the participants, (b)

my beliefs about technology and young children, and (c) my pro-print bias. Following this discussion, I will examine how I provided reciprocity for the participants in the study.

My Relationship with the Participants

My close, personal relationship with all of the participants presented an obvious bias. Of course, I saw my own grandchildren as exceptionally bright and capable language learners and meaning makers. I had to consider these biases through every step of data collection and analysis. As a participant observer in this research, I maintained a high degree of involvement with the participants, but at times took on the roll of observer as I noticed the ways that the children engaged in literacy acts with print and digital materials.

I realized that as a participant observer, I had to take the perspective of both insider and outsider (Spradley, 1980) – researcher, grandmother, and mother. This was particularly true in terms of my role as grandmother; the very nature of interacting with my grandchildren and the responsibility of looking after them when they were in my care often caused me to lose sight of the importance of something said or done, or even something not said or done.

At the same time, I know from the work of other parent and grandparent researchers that the study of members of one's own family also brings advantages (Bissex, 1980; Long, 1998; Martens, 1996, White, 1956). Many of the key findings of these studies (as well as my own) were made possible by the researchers knowing their participants intimately and the opportunity to study the participants over an extended period of time. I feel that had I conducted this study with children in the school in which I

worked or with any other children, in any other setting besides the home and community setting of these three children, the data would not have been as telling because I knew them so well and had multiple opportunities to observe them over a long period of time.

Beliefs About the Use of Technology by Young Children

My personal interest in the topic of technology grew out of many years of observation, professional reading, and my own lived experiences. I was influenced by my theoretical framework grounded in sociocultural constructivism. Because I believe that literacy begins at home and because digital media are unavoidable in our society today, I believed that developing a deeper understanding of literacy practices through the use of both print and digital materials was especially pertinent in this time of rapid changes in communication practices. However, at the time of this study, I viewed technology with equal parts fascination and suspicion. I believed that in many ways, parents and educators were being sold on the *bling* of technology and that researchers needed to consider both the benefits and the ramifications of digital literacy development in the 21st century.

My Pro-print Bias

As a child of the baby boomer generation, I witnessed firsthand many of the technological advances that took place in the last half century. I am a child of the information age, but who lived most of my adult life learning from and communicating through what is now referred to as traditional print-based media. I recognize that in collecting and analyzing data, I brought with me a pro-print bias as well as certain nostalgic longing for a time when there was no such thing as an *app for that*. However, I came to this realization late in the analysis process (which I will discuss in the findings chapters).

I view this admission not as a limitation, but as a way of situating decisions I made about my research design, methods, the contexts of data collection, as well as my interpretations and findings. As Dyson and Genishi (2005) posited, "interpretive research is reflexive: Researchers' data gathering, analysis, and indeed, eventual write-up of others' experiences are mediated by their own lives" (p. 81). While I embrace new technologies, I do not know what it is like to learn about the world through both print and digital materials. Acknowledging my bias allowed me to see past my print blinders to see the possibilities of the ways the children used the materials in their worlds.

Reciprocity

I made every effort to offer reciprocity to both families throughout the data collection period. Often, in the busy lives of young families, the gift of time is invaluable. Offering the couples time alone provided some degree of reciprocity for my intrusions into their daily lives. The times I kept the children overnight or took them to the library allowed the parents to run errands, spend time together, or to get some much needed rest. Involving the mothers in the study through the use of the social networking site offered another opportunity for reciprocity as the parents became more knowledgeable about the literacy development of their children.

Timeline

I began collecting data May 20, 2012 and ended data collection on the children October 31, 2012. I completed the exit interviews with the mothers the first week of November, 2012. The timeline below provides an outline of the progression of this study and the completion of my dissertation (Table 3.8).

Table 3.8

Research Timeline

May 14, 2012	Successfully defended proposal for dissertation research
June 5, 2012	Obtained exempt status from IRB
May-October, 2012:	Data Collection Period
May-November, 2012	Uploading and Coding Data
November, 2012-June, 2013	Transcription and Data Analysis
June, 2013-April, 2014	Writing the Dissertation
May, 2014	Dissertation Defense

Conclusion to Chapter Three

This study was designed to better understand the literacy practices of three preschool children as they used print and digital materials in their worlds. Guided by my belief that learning is social and children use the contexts of their lives to make meaning in the world, I asked what I could learn as I examined the literacy practices of three preschool children, my grandchildren, as they used print and digital materials in their worlds. To answer this, a qualitative design was developed that included opportunities to observe the children as they used print and digital materials over five months and within multiple contexts. A variety of data were collected including photographs, videotape, observation notes, and interviews. It was through observing the children within multiple contexts of my home, their homes, and in community settings such as church, restaurants, and the public library that patterns emerged which led to the findings that follow. The findings in

the following two chapters stand as a piece of the personal literacy narratives written within the lives of each of my three grandchildren as well as to illuminate the role adults played in the writing of those narratives. Findings lead to implications for all stakeholders in the lives of young children in the 21st century.

CHAPTER FOUR

THE CHILDREN USING AND LEARNING THROUGH PRINT AND DIGITAL MATERIALS

This chapter and the chapter that follows present findings from my ethnographic study of three preschoolers as they used both print and digital materials in home and community settings. As I conceptualized and conducted this study, I recognized that living in a Web 2.0 world was very different from the world in which I grew up and that questions needed to be asked to help parents, grandparents, childcare providers, and educators better understand that world. I began the study with the overarching question: *What can I learn from looking at the literacy practices of three preschool children as they engage with both print and digital materials in home and community settings*? In order to explore this question, a variety of data were collected in multiple contexts in the children's lives over five months.

Using the language of Frank Smith (1988), who posited that children join the literacy club as they successfully enter into the literacy practices used in their worlds, I suggest that the engagements these children had with print and digital materials influenced their growth as members of the 21st century literacy club. Visible throughout this discussion are key concepts in understanding early childhood learning including *access, demonstration/modeling, approximation, transmediation, and agency* as related to the use of both print and digital tools across a variety of contexts. Findings presented in this chapter (Figure 4.1) focus on the children's access to print and digital materials and

many of the ways that they used, transacted with, and learned from them. Chapter Five focuses on findings specific to the adults in the study and their roles in the children's access to and use of print and digital tools. Together, both chapters illuminate many ways the children and their families navigated digital and print literacies in the 21st century, waters that are relatively uncharted in the field of early childhood literacy education.

Table 4.1.

Findings Focused on the Children's Access to and Use of Digital and Print Materials

The children accepted and used both print and digital materials as a part of their home and community worlds.
The children's transactions with print materials were different than their transactions with digital materials.
The children transmediated and transferred skills across print and digital materials.
The children responded to both intrinsic and extrinsic rewards offered by print and digital materials.
The children were both experts and apprentices within print and digital environments.
The children exhibited a greater sense of agency, empowerment, and confidence with digital materials than they did with print materials.
The children learned a range of skills and strategies as they engaged with both print and digital materials.

The Children Accepted and Used both Print and Digital Materials as a Part of Their Home and Community Worlds

I began this study by looking closely at the kinds of print and digital materials to which the children had access. The children's environments at home and in other contexts such as church, the public library, retail stores and restaurants offered a wide variety of both print and digital-based materials. Thus, these materials were a part of the cultural settings and mirrored the tools and communication practices, biases and privileges of the

societal environments in which the children lived. This normalcy of access seemed to lead to an acceptance of the materials as a part of their worlds. While analysis of data suggests that the children did engage with both print-based materials in home and other settings, it also confirmed that the children consistently selected digital materials over print materials when both were available. In fact, as will become evident throughout this chapter, the use of the iPad was a common thread in the children's interactions and I believe that, without access to this device, their digital transactions might have been very different. All three children had access to at least one iPad in their home setting and one in my home. I also had an iPod and a Nook in my home.

With these introductory thoughts in mind, this section focuses on findings that illuminate the children's (a) access to and choices about print and digital tools in home settings, (b) access to and choices about print and digital materials in community contexts, (c) exposure to racial bias and gender stereotype in digital and print materials, and (d) emulation of the digital and print practices of adults in their worlds.

Access to and Choices about Print and Digital Materials in Home Settings

As discussed at length in Chapter Three, the children in this study had access in their home settings to a multitude of print materials including children's books, magazines, advertisements, mail, newspapers, and writing materials such as pens, paper, easels, and coloring books. Digital material the children had access to included laptops and desktop computers, iPads, iPods, Nooks, electronic toys, and televisions. While the children had access to a variety of print and digital materials throughout the data collection period, certain materials were accessed more often than others and became the

focus of their engagements. The primary print materials that the children accessed were children's books, and the primary digital tool with which they engaged was the iPad.

Children's books were the primary print-based material accessed in home settings. While there was a great deal of print-based material in home settings, children's books remained the primary print material with which the children engaged. In home settings, the children were regularly read to and had access to many books for self-selection over the course of the data collection period. Books held a place of importance for both families. Both mothers were avid readers and believed in the importance of reading aloud to the children in order to develop concepts of print, increase vocabulary, and build background knowledge.

In addition, both mothers indicated in the initial interview that they had read aloud regularly to the children before bedtime since their infancy. Jenny, Makayla's mother, described their nightly ritual, "Makayla and I generally read at night as long as she is being receptive to it. Her routine is pretty normal. She takes a bath, puts her pajamas on, and then she knows we settle down to read." Jenny shared that she also read to Makayla if she brought a book to her throughout the day and asked her to read. Karen, Madilyn's mother, explained in the initial interview that she read to Aiden and Madilyn two to three times a week and at times, their cousin A'ndrea, or their father, Jason, would read to them. Karen shared that she usually read to the children in the evenings just before bedtime. After the school year began, she or Jason read with Aiden each evening as part of his homework, and Madilyn usually sat with them and listened. The mothers posted videos of one of their read aloud sessions on the social networking site and confirmed these as a typical examples of their read aloud rituals.

When the children had stories read aloud to them, they usually sat in an adult's lap or right beside them as the adult held the book. At times the children would offer to turn the page or chime in by verbalizing a familiar phrase as it was read. At other times they would point to objects or characters in the pictures and discuss what was happening in the story. This was repeatedly observed as I collected data and the mothers confirmed that this occurred frequently as they read to the children in their own home settings. An example that is representative of these instances occurred on one occasion as Jenny read *Chicka Chicka Boom Boom* (Martin & Archambault, 1989) aloud to Makayla. Makayla turned the pages from left to right and at times looked up at her mother after the page was turned (Figure 4.1). As Jenny read "Chicka, chicka, boom boom! Will there be enough room? Look who's coming! L M N O P!" Makayla pointed to the letter O and said, "O."

Figure 4.1. Jenny reading *Chicka Chicka Boom Boom* to Makayla

In addition to engaging with books in the company of adults, the children occasionally browsed through books independently and while sitting with each other. When engaging with books independently, the children often selected books that had

features such as pictures hidden behind flaps or books that had the option to play sounds or music (Figure 4.2).

Figure 4.2. The children browsed through books both together and independently.

The iPad and the iPod were the primary digital material accessed in home settings. While the home setting provided access to laptop computers and cell phones, the digital tools of choice for all three children were touch screen devices, and in particular, the iPad. Each home setting and my home had one iPad which belonged to the adults but was made available to the children. In all settings, the children vied with each other and/or adults for control of the device. Playing with another digital device, such as the Nook or the iPod became more of a consolation than a preference. I often offered these other devices to occupy one child while another took a turn on the iPad. As the study progressed, the iPod became Madilyn's digital device of choice; however the iPad was Aiden and Makayla's favorite digital device.

Turn taking with digital devices. Since I only had one iPad in my home that was available for the children's use, they often had to take turns. On one occasion I decided not to offer Aiden the other digital device so that he could practice taking turns. Aiden leaned over Madilyn as they sat together on the couch, but allowed her to retain control

of the device while it was her turn (Figure 4.3). It was obvious that this was difficult for Aiden to do. He modeled the motions that he thought Madilyn should make as he swiped his finger through the air, but did not interfere with her interaction with the iPad. After several more minutes, he grew more impatient and asked, "Are you finished with the iPad, Madilyn?" Madilyn answered him by saying, "No, Aiden, it is *my* turn."

Figure 4.3. Madilyn took her turn on the iPad while Aiden waited for his turn.

On another occasion, Madilyn and Makayla negotiated for access to the iPod while Aiden took a turn on the iPad (Figure 4.4). Madilyn had the first turn on the device and she self-selected *Dora's Dress up Adventure* (Nickelodeon, 2012), an application which invited the children to dress the character, Dora, in a variety of outfits and place her in a variety of settings such as the desert or a backyard. This application was very much like paper dolls but in a virtual format. After Madilyn played on the device for about five minutes, I asked her to let Makayla have a turn. Madilyn had to be coaxed into offering Makayla a turn, so I repeated, "Madilyn, it is Makayla's turn now. Let her have a turn." I said this several times because Madilyn did not want to stop until her picture was

complete. However, after Madilyn added one last detail to her digital picture, she passed off the device so Makayla could have a turn. Makayla had patiently waited for her turn to play, and when Madilyn handed the iPod to her, she said, “My turn.” The girls had been able to successfully negotiate their access to this digital device, an important learned social skill.

Figure 4.4. Madilyn and Makayla as they took turns on the iPod

Selecting digital over print materials in home settings. Member checking confirmed that digital devices often consumed much of the time spent while the children were in their own homes and that, at home, they often chose digital over print materials. Makayla had a large collection of print materials from which to self-select, but she often preferred selecting applications on her mother’s iPad. Likewise, Karen reported that the children seemed to be “obsessed with the iPad” and that they asked to be read to from print texts less frequently after the iPad was brought into the home. In fact, both mothers reported that it became increasingly difficult to engage the children with print texts the more familiar they became with the iPad. This was reflected in the following dialogue from Jenny’s exit interview. In the interview, as we discussed “reading aloud", we were referring to reading to children from print texts rather than reading aloud to children from

digital devices. This also reveals the adults' tendencies to see print-based materials as *real* reading, which is discussed in Chapter Five:

> Becky: Do you read aloud to Makayla as often as you used to?
>
> Jenny: I pretty much just have to start reading and her come to it. The whole sit down and have a twenty-minute time completely uninterrupted, it doesn't happen anymore. She lets me sometimes and other times she is adamant, and says, "No read, no read."

Similarly, the children typically selected digital materials over print materials when they were at my house. While there were many opportunities for children to self-select print-based materials such as children's books when spending time in my home, all three children selected digital devices with greater frequency than they chose print materials. Examples of this are used to illustrate a range of findings throughout this chapter.

Access To and Choices About Print and Digital Materials in Community Contexts

Throughout the study**,** the children also used print and digital materials while in contexts other than home settings. Print materials in those contexts included books and magazines in the doctor's office, bulletins at church, coloring books and crayons from restaurants, and writing materials such as pens and tablets in the car. Digital materials in other contexts included compact disc players in the parent's cars, cell phones in the hands of most every adult the children encountered, and digital displays such as signs and billboards. The availability of these materials reinforced the children's understanding and awareness of print and digital materials and contributed to their acceptance of these materials as part of their community worlds. Described in the following sections, community contexts in which the children regularly used print and digital materials included (a) church, (b) the public library, and (c) restaurants.

Print and digital materials in church. The children in this study attended church with their parents and/or with me most Sundays and sat with us in the pews during the church service (although at times Madilyn wanted to go to the nursery to play). During this time, some print materials were within easy access of the children such as church bulletins and hymnals, for example. Other print and digital materials such as notepads or coloring books were supplied by their mothers or by me. The children used these materials primarily to stay occupied during the worship service. Although the children's mothers and I usually brought toys for the children to play with during the church service such as dolls or cars, I did not observe the children playing with any objects other than print and digital materials during this study. The children never just listened to the minister or sat without activity; they were always engaged with some form of print or digital material.

Using print materials in church. While in church, the children accessed print material in the form of bulletins, hymnals, and *The Bible.* They also had access to children's books that their mothers or I provided. In addition to these materials, the children were provided with a small cloth bag that contained a small clipboard with an activity or coloring sheet, a pencil, and crayons. These bags were provided by the youth minister to keep children occupied while attending church. The children used these materials at times to write and color. They also used some of the books that were placed in the pews. For example, on one occasion during the singing of a congregational hymn, as was typical for me, I picked up a hymnal, thumbed through to find the correct page number, and began to sing. Watching me, Makayla also picked up a hymnal and began thumbing through it as if she were trying to locate a hymn. She held up the hymnal and

mouthed words as she looked up at me. On another occasion, I was reading the church bulletin and Makayla picked up a bulletin and looked at it just as I did, approximating my reading behaviors. During the service, she often looked up at me when she held print-based materials such as these and said, "Read."

Using digital materials in church. The children's access to digital materials in church was dependent on adults. The children used digital materials in church if their parents or I brought devices such as the iPad, iPod, or one of the digital toys the children owned. Jenny brought the iPad at the request of Makayla and also because she knew that Makayla usually played quietly when she used the iPad. The children typically asked for the devices as soon as we sat down in the sanctuary. I also offered these devices when I took the children to church by myself; my intent was to keep them occupied so that they would not disturb the other members of the congregation.

One problem that the parents and I encountered with the use of the devices in church was that, when we turned the sound off so that the service would not be disrupted, the children often had problems successfully playing the games. The need for the sounds that accompanied many digital applications will be explored in a later finding, but the lack of sound limited the kinds of digital engagements the children could have while in church because they depended on the voices, music, and sound effects within applications to guide their digital play. For example, Makayla was especially fond of playing with the application, *Dora's Dress Up Adventure* (Nickelodeon, 2012). The sound of Dora's voice guided Makayla as she selected clothing items for the virtual paper doll - a pinging sound let her know when it was time to release her finger from the touch screen and place the item of clothing on Dora. One Sunday, I did not have headphones with me, so I turned off

the sound when the service began. Without the sound, it was very difficult for Makayla to use the application. Aiden also experienced this frustration when he tried to play his racing applications during church without the sound, but this did not stop the children from wanting to access digital materials in church (Figure 4.5).

Figure 4.5. Aiden using the iPad in church

Print and digital materials in the public library. During the data collection period both print and digital materials were available and accessed by the children at the public library. All materials in the children's section of the public library were placed within easy reach of the children and included magazines, children's books, comic books, novels, computers, compact discs, and audio books on tape. The space provided tables, a couch, and several small chairs for children to use while browsing materials. While at the library, the children were able to move around freely among the available print and digital materials, and I supervised them as they self-selected materials with which to engage.

Using print materials in the library. The primary print materials that the children accessed while at the public library were children's books. The children's section of the public library was arranged so that the fiction picture books were accessible on low shelves, and many books were placed facing forward on the ends of these shelves for display. Additional books were placed on the tops of the low bookcases for easy access and display. This allowed the children to self-select books during library visits. Nonfiction books were arranged on very tall shelves to the left of the fiction section and were less accessible for the children. The nonfiction section also held the juvenile fiction. Juvenile paperback books were located on a large, circular metal display near the literacy computers. Easy paperback books were located at the back of the children's section on a large metal rack. The rack was so tall that over half of the selection was out of reach for Makayla and Madilyn; however, they did select books from the lower shelves of this rack at times because they were attracted to many of these titles that featured characters from television and videos with which they were familiar such as Dora, Sponge Bob, or Minnie Mouse. Children's magazines such as *Highlights* and *Ranger Rick* were located on an upright metal rack attached to wall near the easy paperback books. The children did not self-select magazines during any of our trips to the library.

When the children self-selected books in the library, they rarely brought the books to me to ask me to read aloud. Instead, they usually sat at one of the low tables and browsed through the books independently. They turned the pages, studied the illustrations, and at times pointed and named objects. Makayla was particularly fond of thumbing through chapter books and often selected titles from the rack and looked at the

covers. Madilyn liked to browse through the board books and often selected several before returning to a table to look through the books (Figure 4.6).

Figure 4.6. Madilyn as she selected a board book from the children's section of the public library

Aiden did not typically initiate the self-selection of print books while in the library. On one occasion, I asked Aiden if he wanted to read some books and he just shrugged his shoulders and said, "Not really. Can I just play your iPad?" When he did self-select books, they usually contained characters that he recognized from television such as Spiderman or Sponge Bob. As I will discuss in a later finding, Aiden was coaxed into engagement with print books at the library through participation in their summer reading rewards program.

Using digital materials in the library. Digital materials accessible to the children in the library included DVDs, audio tapes, computers for accessing the card catalog and the Internet, and two computers which the children's librarian called *literacy computers*. These computers were preloaded with programs designed to build literacy skills in young children and their use was limited to children from the ages of two to ten. The literacy computers did not provide access to the Internet and required the use of headphones so

that the reading area remained quiet. In order to access the Internet in the children's section, an adult had to provide their library card to the assistant at the desk and request a key code to enter into a personal device. There were several computers in the children's section in which the key code could be entered to allow for access, but the children did not access the Internet over the course of the study while in the library.

Of the digital materials made available in the public library, the children often chose to use the literacy computers. If both of the literacy computers were available, Aiden and Madilyn often worked independently of each other (Figure 4.7), each at a separate computer, and accessed applications that they self-selected by using the mouse and keyboard. Through repeated use, the children became adept at self-selecting applications on the literacy computer in this way and often returned to personal favorites.

Figure 4.7. Madilyn and Aiden as they used the literacy computers in the public library

One program that Madilyn and Makayla often selected on the literacy computer was *La Casa de Dora* (Nickelodeon, 1999). This was a storytelling application in which, the character, Dora taught about different items within a home. The children selected the

room they wanted to enter, and Dora took them on a virtual tour of her home as she identified items in the home in both English and Spanish. Both Madilyn and Makayla were particularly fond of selecting the room in which Dora taught about musical instruments. Aiden often self selected the digital story *Stellaluna* (Cannon, 2008), but also liked *The Amazing Human Body* (Global Software Publishers, 1998), a science application that involved games that taught about the bones in the human body.

Issues with headphones. The literacy computer required the children to wear headphones. This was a source of frustration for the children, Madilyn in particular. She did not seem to be comfortable wearing the headphones. She often took them off to ask me what to do next or make a comment about what she was doing. Much like the difficulty Makayla and Aiden experienced as they tried to engage with applications without sound in church, Madilyn needed the headphones but did not like to wear them.

This was best exemplifed one afternoon when Madilyn used the literacy computer while she and I visted the library. Madilyn sat down at the computer, put on the headphones as she had seen Aiden and other children do, and self-selected the *La Casa de Dora* (Nick Jr., 2000) application on the literacy computer (Figure 4.8). I could see that she was using the *La Casa de Dora* (Nickelodeon, 2000) application that allowed her to select a room to learn the English and Spanish names of objects and people in a home, but I did not know what the mediator within the application was asking of her because Madilyn was wearing the headphones. When I asked, “Madilyn, what does it want you to do?” She shrugged her shoulders and responded, “Nothing.” She appeared frustrated as she jerked the mouse back and forth trying to control the action of the pointer on the screen.

Figure 4.8. Madilyn wearing headphones as she used the literacy computer

The children were not very forthcoming in telling me about their digital play on the literacy computers. The use of headphones, in addition to causing some frustration for the children, isolated me from their engagements beyond seeing the action on the screen and observing their actions. One day, for example, Aiden spent time playing the *Amazing Bones* game, one of the options for play on the literacy computer. During this engagement, he manipulated the mouse and selected different bones to virtually put a skeleton together. I could see him as he moved the bones around on the screen, but I could not hear what he heard. I was curious about what he learned. When I asked Aiden what he had done while on the literacy computer, he shrugged his shoulders and told me, "Just playing." Issues surrounding headphones were repeatedly observed in the data and are explored later in additional findings.

Other digital devices in the library. There were times during the data collection period when the literacy computers were not available for use either because other children were using them or because they were out of order. If the children engaged with other digital devices during these visits, it was because the children's mothers or I

provided them. The public library did not have any touch-screen devices available for patron use at the time of the study, nor did they have any eBook holdings available for patrons to download. The children often asked me to use my iPad, iPod, or Nook while we were visiting the library and they engaged with them on numerous occasions while at the library. For example, on one occasion when the literacy computers were in use, Madilyn asked, "Nana, can I play your iPad?" I placed the iPad on one of the low tables in the children's section. She knelt down at the table, turned the device on and selected the *Dora's Enchanted Forest Adventure* (Nickelodeon, 2012). She listened as the story was read aloud and swiped the screen from right to left to advance the story. When the story was completed, she returned to the home screen by selecting the icon of the house and then selected the option to place stickers on a picture of Dora and other characters from the story. She engaged with this eBook for 20 minutes before getting up to walk back to see if the literacy computer was available.

Selecting digital over print materials at the library. In spite of access to both print and digital materials, while in the library, the children rarely chose to engage with print when offered a choice. In fact, when allowed to self-select, they rarely chose the option to look through books or be read to. They preferred the use of the computer or iPad. As mentioned previously, I had a great deal of difficulty as I tried to engage the children in reading print texts while we were at the library. In another example, on one occasion I sat in the rocking chair of the children's section and repeatedly offered to read to Makayla. She refused to join me as I read aloud and instead, walked up and down the aisles between the bookcases saying, "Home, Mommie, home." She continued through the aisles that held the nonfiction collection and occasionally looked up at the shelves of

books that towered above her. As she walked down the aisle that held the collection of DVDs, she paused, looked up at the collection and said, “Dora,” but continued on until she stopped at the literacy computers. She crawled into the chair and began to move the mouse around.

Aiden was equally difficult to coax into sitting with me for a read-aloud while at the library. He was more interested in the literacy computer than reading a book or listening to me read a book to him. When I tried to find books that he could read, he told me he could not read yet. For me, this was perhaps the most personally confounding experience of the study. The print aspects of the library had always held a special place in my own literacy life, and I wanted the children to experience the same joys through checking out and enjoying books. However, instead of selecting books and willingly joining me for read alouds, they often moved from the literacy computer to the stacks of books, and then back to the literacy computer as if they were moths being drawn to a light. They often competed for the use of the computer and jostled to see who would get in the seat and gain control of the mouse (Figure 4.9).

Figure 4.9. The children jostled for control of the literacy computer in the library.

Following such incidents, I had to exert control over who used the literacy computer by requiring the children to take turns. For example, one day, as often happened, one of the literacy computers program was frozen and not available to the children. On this occasion, I allowed Madilyn to have the first turn on the available computer while Aiden looked through a book he had self-selected and Makayla wrote in her notepad. Within a few minutes, Aiden walked over to the literacy computer where Madilyn was engaged in play (Figure 4.10). He appeared to be checking to see if she was ready to let him have a turn. He held the book he had been reading behind his back. As I

Figure 4.10. Aiden checked to see if Madilyn was ready to let him have a turn on the literacy computer at the public library.

As I analyzed this photograph, I realized that the children accessed print and digital materials at the public library as an *either or* experience. They were either engaged with books, or they were engaged with digital materials, but they did not usually engage with both simultaneously and clearly preferred digital to print experiences.

Print and digital materials in restaurants. Due to demanding parent work schedules and economic access, eating out regularly was very much a part of the lives of

these three children. At times the parents brought along toys to keep the children occupied while they waited for food to be served. However, most of the time the children were given print or digital materials which allowed them to engage in quiet play through drawing, coloring, or playing digital games. At times, print materials were provided by the restaurant. At other times, the children used both print and digital materials supplied by their parents or me. Member checking confirmed that these materials were used to keep the children entertained or occupied.

Using print materials in restaurants. A variety of print-based materials were available to the children while they were in restaurants. Children's menus were regularly provided and often had word games or puzzles in which the children could engage. Paper placemats also provided opportunities to engage with print materials. Additional print materials were provided by the parents or by me such as children's books, coloring books and crayons, or a small pad of paper on which the children wrote or drew. The children's menus and crayons were usually given to them when they first sat down in a restaurant. Aiden was often the first to choose to engage with these materials. On one occasion, for example, Aiden asked me to help him solve a word search on the placement provided by the restaurant. The placemat had activities for children to do such as coloring, and, in this case, a word search that included the names of the planets. This led to a discussion of the planets as we searched for the letters that spelled out the names of the planets.

In restaurants, the parents or I often took part in solving mazes with the children, playing tic-tac-toe, or helping the children color pictures. On one occasion, for instance, I helped Madilyn solve a maze on her menu and then played tic-tac-toe with her. The children readily engaged with these materials when they were made available. At other

times, the adults carried on conversations with each other while the children colored or helped each other solve puzzles. Makayla often chose to make marks on her menus with the crayons, but preferred writing in the small note pad that her mother carried with her on outings (Figure 4.11).

Figure 4.11. Makayla writing in her notepad in a restaurant

Using digital materials in restaurants. Data repeatedly showed that the children also had access to, and used, digital materials when they were in restaurants. The materials were provided by the parents or me and included iPhones, iPads, iPods, Nooks, or electronic children's toys such as the Leap Pad, a handheld gaming device designed for preschoolers that resembled a tablet. The parents confirmed that the materials were used to keep the children occupied during meals because the parents did not want the children to disturb others while eating out.

On one occasion, for example, Aiden and Madilyn went to breakfast with Karen and me. Karen and I each had an iPad with us so, after our food was ordered, Aiden asked if he could play with my iPad. I asked Karen if it would be alright and she told Aiden that he could play with it until the food came. Madilyn then asked if she could play

with her mother's iPhone. Karen decided to allow Madilyn to play with her iPad rather than her iPhone because she was checking her texts.

As I reflected on this incident, it occurred to me that I also often used the time I spent waiting in restaurants to catch up on emails and check my texts. The children had seen their parents and me use digital devices while in restaurants on numerous occasions; therefore, the notion of using digital devices at mealtime not only demonstrated the children's desire to use digital devices while in restaurants, but further demonstrated the ways they emulated adult restaurant behavior which will be discussed later. On this occasion, the children sat quietly and played the games they had selected (Figure 4.12). When the food arrived, they had to be asked several times to turn off the devices so that they could eat. At one point, Karen made the comment that she believed "they would rather play the iPad than eat."

Makayla often also played with digital devices while waiting for the food to be served and, as with Madilyn and Aiden, there were also instances when the devices remained out during the meal. This often occurred when Jenny and I went to lunch together. Makayla liked to watch videos on the iPad. On one occasion Jenny propped the iPad up like a small television screen and Makayla viewed an episode of *Dora* while she ate her lunch (Figure 4.13). Member checking confirmed that Jenny felt that it was important that Makayla remained quiet so that she would not disturb other patrons in the restaurant. Removing the device was usually met with a loud outburst from Makayla, so Jenny often allowed the device to remain on the table during the meal.

Figure 4.12. Aiden and Madilyn played on iPads at a restaurant while waiting for their meal

Selecting digital over print materials in restaurants. In restaurants, when presented with options for engaging with print materials or their mother's iPhone or my iPad, the children usually opted for the digital device. As mentioned earlier, Makayla often asked to watch a video during mealtime. Jenny would often prop the device up to the right of her plate and view the video as Makayla ate her meal (Figure 4.13).

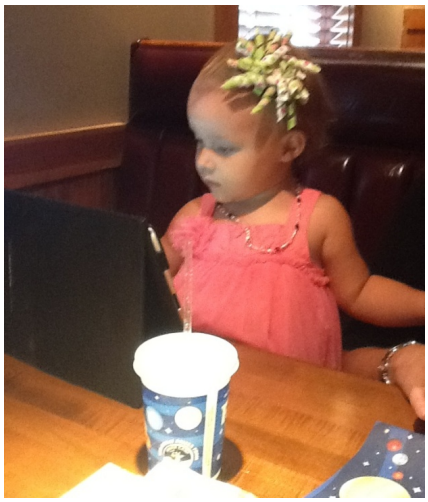

Figure 4.13. Makayla playing the iPad during lunch at a restaurant

The finding that the children tended to choose digital materials over print materials was further supported by an interesting incident when Aiden was given a menu which offered both print and digital options within the print-based medium (Figure 4.14). The menu was a four-page spread that was folded in the middle and opened up much like a print book. The words "Andy's Roadside Adventures" were at the top of the front page. This page also included a map of the state of Louisiana along with a picture of the character, Andy the Armadillo. The restaurant's logo (Texas Roadhouse) was at the bottom of the page. The booklet opened up to make a two-page spread that included many print options for the children to engage in such as a picture to color, a maze to solve, and facts and questions to answer about the state of Louisiana. The choice of entrées for the children was on back of the menu. Above the menu there was a picture of a family and the words "Family Fun" written across a red banner. Printed underneath were the words: *Have you ever written a collaborative story? Parents and Kids take turns writing the next sentence. Andy has started the story*. This was followed by the phrase: *It was a dark and stormy night*. Just below this was a depiction of an iPad. The iPad displayed a colorful picture of Andy the Armadillo along with images of paint brushes and small splashes of various colors across the bottom. Beside this image were the words, *New: Andy's Art Kit*! This was followed by a description of the application that was available online at the Apple App Store as well as the QR code which stands for quick response code and is a kind of barcode that is readable by iPads and iPhones linking to the *Andy's Art Kit* software. In these ways, the menu served several print purposes as well as digital purposes for families who had access to digital devices.

Figure 4.14. A menu that provided invitations for print and digital engagements

As soon as Aiden was handed the menu, the depiction of the iPad immediately grabbed his attention and he directed his questions about the menu to me. He asked, "Nana, is this an app that we can get for your iPad?" Although the menu also provided a prompt for children's writing, the invitation to write a story did not elicit a response from Aiden or his parents, but the invitation to download *Andy's Art Kit!* (Kidsmart, 2011) did. Aiden asked his mother if he could download the application when they got home, which they did. On closer inspection, this children's menu pushed me to consider the way I previously viewed print and digital materials as separate entities rather than layers of opportunity for literacy engagements. Much like the applications found in digital environments, this menu offered a layering of opportunities for engagements.

Exposure to Racial Bias and Gender Stereotype in Digital and Print Materials

As I describe the children's access to and choices about print and digital materials, it is important to discuss those materials with regard to messages

communicated about race, ethnicity, and gender. In 2012, Erin Miller's dissertation study detailed the messages of White dominance that were endemic in her children's lives and received through the materials they accessed at home, school, church and in other community contexts. In my study, the digital and print materials to which the children had access also privileged dominant cultural norms by omitting, marginalizing, and/or stereotyping diversity particularly in terms of race, ethnicity, and gender. As I surveyed print and digital materials in the children's worlds, White people were "dominant, central, and normal" (Miller, 2012, p. 75). In addition, when people were depicted who were not English-speaking or European American (White), they were often depicted using inaccurate and/or offensive stereotypes. In the same way, male and female characters were often presented according to gender stereotypes.

Throughout the data collection period and through on-going analysis of my data as I began transcribing, I became increasing aware of this lack of or inaccurately portrayed diversity in the materials that the parents and I selected to provide for the children to use. This fact went unnoticed by me until I was well into transcription and data analysis. I explore issues surrounding this lack of awareness in Chapter Five; here I merely describe the lack of diversity in the digital and print materials to which the children had access.

Access to racial bias in digital materials. My close examination of the contents of my personal iPad led to the realization that most of the applications I downloaded for the children reflected a privileging of European American characters and gender stereotypes. Using a chart I developed with the intention of keeping track of the frequency with which the children accessed certain applications, I took a closer look at

the applications and electronic books to which the children had access when they were using my iPad. I did not analyze the applications the children accessed on their parent's digital devices or at the library because I felt that the parents' decision not to supply me with the list of applications earlier in the study indicated that this was not something that they wanted to share and my recognition of the need for an analysis of applications came long after the library visits reported in this study. However, the mothers and I did discuss bias in digital materials during member checking which is discussed later in this section and in more detail in Chapter Five. The results of member checking and my own informal observations give me confidence that the omissions and stereotypes found in applications on my iPad are representative of the kinds of applications with which the children engaged in other contexts.

For the initial analysis, I looked only at the race of the characters in the applications and eBooks I had available on my personal iPad. To do so, I opened the application or eBook and looked to see if the only people represented were White or if the application or book represented diversity evidenced by the inclusion of other races. I based my decision on my first impression of the primary content when the application was opened. I also considered whether the characters were only animals and if there were no people (or no visible way to identify race) contained within the application or book (Table 4.2).

Table 4.2.

Chart Used for Analysis of the Applications and eBooks on my iPad.

Name of Application	**Description of Application**	**Down-loaded for**	**Only or Predominately White People**	**One or More Persons of Color**	**Only Animals or Race of People Not Visible**
Dora ABC	For practicing writing letters	Makayla		√	
Teach Me Toddler	Practice of shapes, letters, and sounds	Madilyn	√		
Preshool Island	Practice for spelling, letter, and sounds	Aiden		√	
Dora's Rhyming Word Adventure	Matching rhyming words, phonics	Aiden	√		
Poppet Puzzles	Shapes arranged to create a picture	Aiden	√		
Pocket Zoo	Animal flash cards	Aiden			√
*Chic Baby	A virtual paper doll application	Makayla and Madilyn		√	
*Note: The *Chic Baby* application had babies of color on the home screen, but they were not available for use in the *lite* version.					

In order to analyze digital content, I counted the number of applications or electronic books that were dominated by or only depicted White people, the number that had persons of color, and the number in which the only characters were animals or when the race of people was not visible. This was often the case in many of the car racing applications that Aiden preferred, in which the characters' faces and hands were not visible because they were covered by racing helmets and gloves. I later went back to the applications that did represent evidence of diversity and looked for evidence of stereotypical or distorted representations (Table 4.3).

Table 4.3.

Number of Applications or Electronic Books on My iPad that Reflected Dominant Culture or Diversity

Basis for analysis	Number of Applications and eBooks downloaded for the children on My iPad	Number of Application or eBooks that Reflected only White people	Number of Applications or eBooks that Reflected One or More Persons Of Color	Of those representing Persons of Color, the Number of Negatively Stereotypical or Distorted Representations	Number of Applications With Only Animals or Race was Not Physically Visible
Frequency	103	49	12	4	38
Percentage	100%	47%	12%	4%	37%

Analysis of these applications and eBooks revealed that 47% reflected only White populations, 37% used only animals as characters or race was not clear, and only 12% included one or more persons of color. In addition, 4% of the applications depicting persons of color did so in ways that were either negatively stereotypical or offensively distorted. This closer inspection of the lack of representation of persons of color and/or the negative stereotypes led me to further analysis. In one collection of easy reader eBooks on my iPad, 30 out of 37 titles depicted White children on the covers of the main menu. Only three of the covers in this collection of eBooks depicted African American children, three were Asian, and one appeared to be Latino. On closer inspection, some of the titles had pictures of children of color on the main menu, but when the book was selected, the title pages often had only images of White children. This was the case with the title *I Like My Brother* (Grasshopper Apps, 2011) (Figure 4.15) and in other books in that series. While the contents of the books in the *I Like . . .* collection (Grasshopperapps, 2011) contained some non-stereotypical images of racial groups other than European

Americans, the first impressions made by the images on the covers of the eBooks or applications had the potential to make an immediate and lasting impression, sending a message of White superiority to children using those applications.

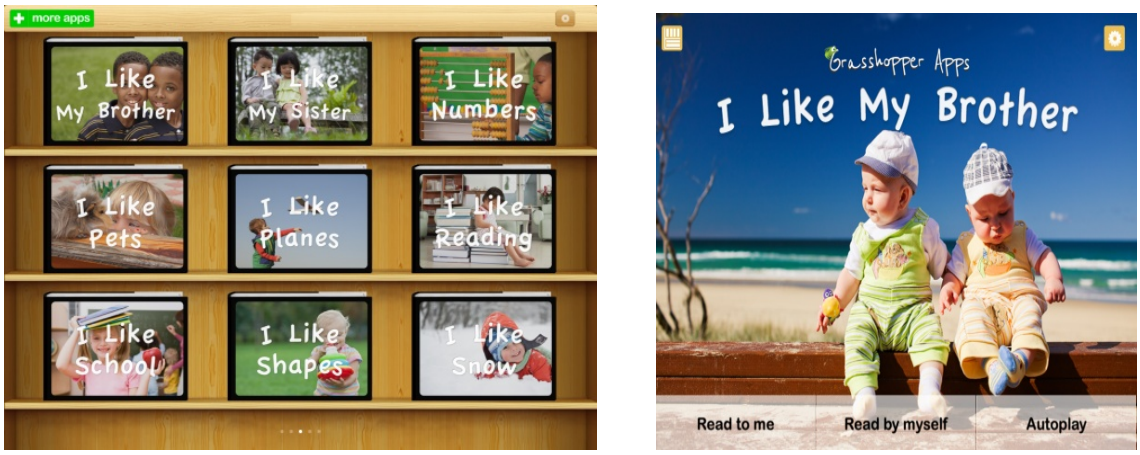

Figure 4.15. Screen shots of the main menu and the title page of *I Like My Brother*

Negative stereotyping occurred in the depiction of some non-human characters within digital content. For example, in app, *Finding Nemo Interactive Comic* (Disney Pixar, 2012), one of the villains in the story is a barracuda depicted with dark gray and black stripes. A quick Google search confirmed for me that barracudas are in fact luminescent, silver. This was one more message sent about Blackness as connected to negativity and danger, the Black barracuda as the villain.

Other evidence of racial bias and omission in the applications came from examples such as *Chic Baby* (Touch Apps, 2012), a virtual paper doll application. The *lite* version of this application, which was available for free in the iTunes store, provided only a White, blond, blue-eyed child to dress. Children of color could only be dressed when users *purchased* the full version of the application (Figure 4.16). In addition, of the three children supposedly representing persons of color in the purchased application, the

two boys were depicted with darker skin and brown eyes, one with a bandana and the other wearing a ball cap turned to the side, clearly racial stereotypes and the other appeared to be an attempt to depict an Asian child using stereotypical narrow eyes and yellowish skin tone.

Figure 4.16. A screen shot of the child-characters available for dress-up on the *Chic Baby* (Touchapps, 2012) application

As I examined other applications that I had downloaded for the children on my iPad, I found similar examples of an obvious lack of diversity and stereotype. In fact, only a few of the applications on my personal iPad represented diversity with non-stereotypical images of persons of color. This was not an exhaustive analysis but it did cause me to recognize that the digital materials to which the children had access in my home were racially biased and perpetuated White privilege.

Member checking confirmed that the mothers both agreed that the majority of the print and digital content to which the children had access reflected the children's own race and culture – White, English-speaking, middle class. Jenny and Karen both pointed out that Dora, in the *Dora's Dress Up Adventure* (Nickelodeon, 2012) application, was

Latina, but we all agreed that, while the children loved the character, her depiction with a distorted head was a negative characterization communicating distortion to the children. Jenny also pointed out that, in the television cartoon *Doc McStuffins* (Disney Jr., 2012), the main character, Doc McStuffins, is African American, but this character was also drawn with a distorted head and an inhumanly thin neck. We discussed how these characters did not resemble real human beings (Figure 4.17) and communicate a lack of normalcy to children who view them.

Figure 4.17. Images of Dora the Explorer and Doc McStuffins

Availability of diversity in applications and electronic books in general. My awareness of the lack of diversity within the applications and eBooks on my own iPad led me to do an online search for applications and eBooks to see what I could find about the representation of persons of color in general. While it was not an exhaustive search, what I found was that there was very little to be found. An example includes one search in which I put in the query *iTunes Applications for diverse cultures*, and was directed to *Flat Stanley* (Flatter World, 2010), an application that the developers claimed would "help

children learn about travel while discovering different cultures to develop a love for reading (iTunes, para. 2)." However, Flat Stanley and his female counterpart, Cowgirl Stella, are both White and the examples of travel destinations and sights within them are largely stereotypical in nature.

I tried an additional search query in the iTunes store using the key words *African American Applications*. It yielded a variety of applications, but only four that were targeted to young children - one dealt with big hair, one was a coloring page, and one was an eBook about an unfriendly tree. In my search, only one application for children provided a strong representation of Black culture, *A Song for Miles* (Russell, 2011). In fact, this application was marketed on the Internet as the first eBook sold in the iTunes store that authentically and positively represented elements of African American culture (NewsOne, 2011). I tried similar queries to look for additional evidence of diversity in the Apple and android markets, but was not successful in finding applications for children that authentically depicted children or adults of color with the exception of a website funded by the Screen Actors Guild which housed a collection of children's books that had several culturally relevant titles read by famous African American actors (www.storylineonline.net). While not comprehensive, this brief online search led me to believe that there is an obvious lack of diversity in the digital market in applications for children.

Access to bias in print materials. I also observed examples of bias in the print materials to which the children had access in my home. I conducted a similar analysis of print books by looking at first impressions of the visible content for evidence of the dominance of European Americans, cultural diversity, and stereotype. The analysis I did

on the books and magazines available to the children in their play area at my house revealed that 52% were dominated by or only depicted White characters, and only 9% of the books and magazines that I provided had images of persons of color prominently displayed on the front covers as well as within the pages of the books. Of the 9% of the books and magazines that did reflect diversity within them, over half of them contained distorted or stereotypical representations. In fact, the print books I had in my home showed less evidence of diversity than the digital content of my iPad (Table 4.4).

Table 4.4.

Number of Children's Books and Magazines in my Home that Reflected Dominant Culture or Diversity

Description of categories for analysis	Number of Children's Books and Magazines	Number of Books and Magazines Dominated by European Americans (White people)	Number of Books and Magazines With One or More Persons Of Color	Number of Stereotypical or Distorted Representations of Persons of Color	Number of Applications Using Animals or Non-human Characters
Frequency	108	56	10	6	42
Percentage	100%	52%	9%	5%	39%

Just as the lack of diversity in my digital content had gone unnoticed by me, I had also remained unaware of the lack of diversity in the books and magazines I made available in my home. This was even more disturbing to me than my obliviousness to digital content because I had an extensive library of culturally relevant titles in my school book collection.

Access to gender stereotype within digital materials. Gender representation was another issue reflected in both the print and digital materials provided for and accessed by the children. Some character depictions sent definite gender messages

through their appearance, voices, and actions. For example, one of the applications that I downloaded for Madilyn and Makayla was *Minnie's Bow Maker* (Disney, 2012). The characters in this application were mice and ducks, but the voices and the choices of clothing for these animals implied a definite gender message that Minnie was a girl (Figure 4.18). While it is not problematic that Minnie was a female mouse, what did reflect bias was the fact that I overwhelmingly chose stereotypically "girly" applications for Makayla and Madilyn and stereotypical "boyish" applications for Aiden. This was further reflected when I told Aiden on numerous occasions that the *Minnie Bow Maker* (Disney, 2012) was "one of the girls' apps."

Figure 4.18. A screen shot from the *Minnie Bow Maker* (Disney, 2012) application that I downloaded on my iPad

Other applications that I downloaded for the girls also demonstrated my gender bias. Another example was *Chic Baby* (Touch Apps, 2012), an application in which images of children on the home screen depicted the girl babies as with bows and flowers in their hair while the presence of the ball cap presented one of the boy babies as more physically active.

Applications that depicted Disney princesses also presented gender stereotype. This was apparent in an eBook that I had on my iPad called *Royal Party* (Disney, 2012).

This book presented all the Disney princesses as young women with exaggerated small waists, curvaceous figures, long flowing hair, and small pouty mouths. All the young women were stereotyped as being in need of a handsome prince to save the day along with obvious stereotypes in terms of the exoticizing of the princess of color with the shape and slant of her eyes (Figure 4.19).

Figure 4.19. A screen shot of the eBook *Royal Party* (Disney, 2012)

The applications that I downloaded specifically for Aiden, many of which were racing apps, depicted male characters as the drivers in these action-packed games. One application in particular that demonstrated gender bias was *Kids' Wheels* (Kid Baby Toddler LTD, 2012) which depicted the image of a boy – no girls – as the driver of different vehicles on various racing courses. Most of these racing applications attempted race and gender neutrality by not showing images of the drivers or by putting the drivers in full racing gear so that the skin could not be seen. In retrospect, I should have asked Aiden who he thought was driving these cars. One of these racing applications also objectified women by depicting them in tight fitting, low cut shirts that revealed their ample cleavage and slender midriffs. This application involved police chases, and all the

voices intended to sound like the police communicating with the dispatcher were those of men.

Exposure to gender stereotype within print materials. Print materials available in my home for the children also reflected gender messages that girls are sweet and fragile and boys are rough and tumble. The children were very much enamored with popular characters from television and movies. This prevalence of *kinderculture*, early childhood pop culture (Steinberg, 2001), often influenced the purchase of print materials. My collection of children's books as well as coloring books contained these characters: Minnie and Mickey Mouse, Spiderman, and the Disney princesses. Similar gender messages were also prevalent in the children's choice of toys and my choices of toys to provide for them.

On numerous occasions, both mothers confirmed that the children had well defined understandings of gender roles in terms of stereotypical understandings about what constitutes girl or boy toys. Karen told me that, while watching commercials for certain toys, Madilyn would often say, "Aiden would like that. That's a boy toy." This was evidenced on one occasion that I took Makayla to a toy store. She had looked at a bubble machine that depicted one of her favorite television characters, Dora, when she noticed the bubble machine that depicted Lightning McQueen, a character from the Pixar film *Cars* (Disney Pixar, 2011). Makayla pointed at the bubble machine with a red car and said, "Aiden toy" (Figure 4.20).

Figure 4.20. Makayla looking at *boy toys* that she thought Aiden would like

Emulating Adults

Early childhood experts have established that young children learn about and engage in their cultures through observing and emulating the people in their lives (Rogoff, 2003; Vygotsky, 1978). Additionally, Lave & Wenger (2003) advanced the notion that learning often begins through peripheral observation of, and gradual participation in, cultural practices. Data suggest that the adults in the lives of the children provided models of the uses of print and digital materials and controlled access to and, in large part, engagements with those materials. In Chapter Five, I will discuss the role of adults in selecting and providing materials for the children. This section focuses on ways that the *children* emulated and learned from the adults' print and digital practices.

All of the adults in this study were consumers of print and digital materials. The adults read various kinds of print based materials for information and entertainment, and they used their iPhones, iPad, and computers for various purposes in their personal and professional lives. Through these actions, adults modeled print and digital literacy practices daily. As the children observed adults using print and digital materials in their home and community settings, they became interested in the tools and demonstrated a

desire to engage with the tools in similar ways. These materials allowed the children to enter into adult worlds through play and *try on* both digital and print literacy practices.

The children also emulated each other's use of print and digital tools. While all three children had different degrees of print and digital skills, they seemed to enter into engagements with the intent to emulate the practices of adults and peers in their lives. I use the term, *emulate* as opposed to *imitate* because I viewed their actions as self-directed and purposeful approximations of the actions of persons they loved and admired (their parents and grandparents) rather than thoughtless reproduction of actions as is implied by the term imitation.

Through their observations of and engagement with these practices, the children seemed to gain acceptance of particular print and digital materials as part of their worlds. While, throughout the study, the children moved in and out of print and digital engagements seamlessly, for clarity, I have separated the kinds of print and digital literacy behaviors that the children emulated.

Emulating reading behaviors with print materials. As I observed the children using print-based materials, there was a clear pattern in their emulation of adults' behaviors. When self-selecting books in my home or in the library, the children usually picked up one book at a time and looked through the book from front to back, stopping occasionally to look at illustrations. Makayla was often seen thumbing through large books such as novels or the church hymnal. She had seen her parents do this when they got new textbooks or novels to read and in spite of her small hands was very adept at allowing the pages to flip past her thumb as she glanced at the contents of the book.

Several instances of the ways in which the children emulated adult reading behavior was captured by the mothers through video and shared on the social networking site. For example, in one video posted by Karen, Madilyn emulated her mother's reading behaviors. In the video clip, Madilyn sat beside her mother and helped her turn the pages from right to left, pointed to the characters in the illustrations, and at times, ran her finger under the text.

On another occasion, early in the study, Jenny posted a photograph on the wiki of Makayla as she looked through recipe books. Following the post, Jenny explained that she had been looking through several recipe books in search of a specific recipe that she planned to prepare when Makayla joined her at the table, reached over, and took one of the recipe books from her. Makayla slowly turned the pages and stopped every so often to look closely at a picture or a recipe, and then continued to browse through the book. Makayla then pushed that book aside and reached for another book just as Jenny had done.

Yet another example of Makayla emulating the print-based practices of the adults in her life was when she sat down in the reading chair to read her books. One of Makayla's favorite television shows was *Blues Clues* (Nick Jr., 2012). The main character on the show encouraged viewers to sit down and think as they tried to solve the clues to a mystery. As Makayla viewed episodes of this show, she often went to sit in her own chair with a book to read much like the character in the television show. When Makayla sat down in her chair to read, Jenny would often sing the refrain from the television show, "I sit down in my thinking chair and think, think, think." This

exemplified how Makayla emulated the behaviors of beloved characters on television as well as her parents and other people in her life.

Figure 4.21. Makayla sitting in her reading chair reading a book

Emulating writing behaviors with print materials. Across the data, the children emulated writing behaviors with print-based materials. This was more evident with Makayla and Madilyn than with Aiden. The girls both noticed that I took notes regularly in a small notebook throughout the data collection period and wanted their own small notebooks in which to write. They often scribbled on the notepads and then read their writing to me. During this study, Makayla frequently saw me taking notes in my own notepad or on sticky notes, and she emulated my actions as a writer by writing in notepads or on sticky notes. Jenny carried a small spiral notepad in her pocketbook, much like the one that I used for taking field notes. Makayla often wrote in this pad when we were in other contexts such as restaurants, and she also liked to write on sticky notes while in my home (Figure 4.22).

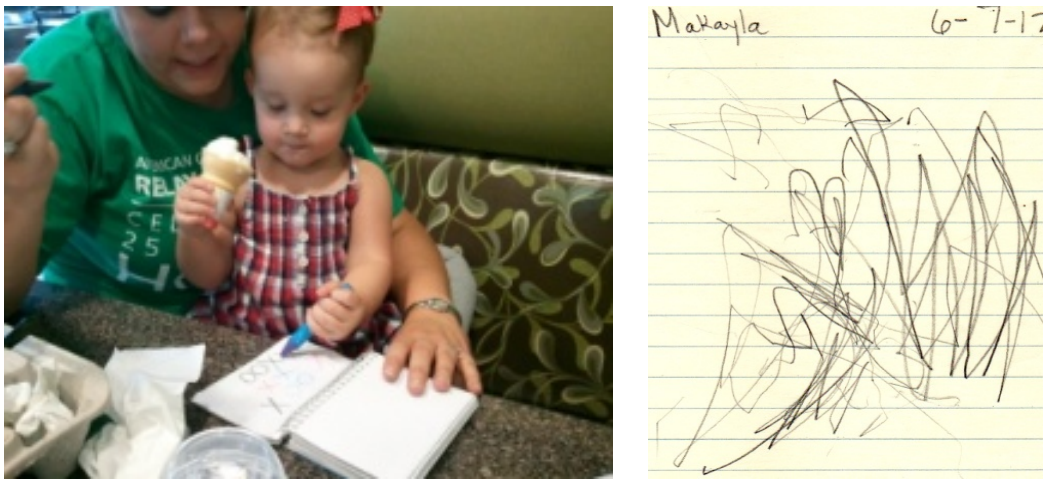

Figure 4.22. Makayla writing in her notepad while at a restaurant and one of her sticky notes

Makayla also emulated the way her mother, Jenny, wrote in a lesson plan book each week. Jenny was an elementary school teacher, and she often wrote her lesson plans at her home while Makayla played in the den or watched television. Makayla observed Jenny writing in her plan book, and on many occasions Makayla took Jenny's pen and added her own writing (Figure 4.23).

Figure 4.23. Makayla writing in Jenny's lesson plan book

As will be discussed in a later finding, Aiden engaged as a writer in different ways than did the girls. He was an avid artist and often drew pictures on pads and/or blank sheets of paper. He also engaged with the print based materials that involved word play such as word finds and puzzle solving which at times involved some writing. On one occasion early in the study, Aiden did engage in a written conversation (a strategy used to engage young writers whereby one person writes a comment or question and then the other person reads and responds in writing) with me, but after the first turn, he indicated that he did not want to write anymore and verbally asked me questions rather than writing them (Figure 4.24). It is also important to note that while I tried to involve Aiden in written conversations on other occasions throughout the study, this is the only time he participated by writing back to me.

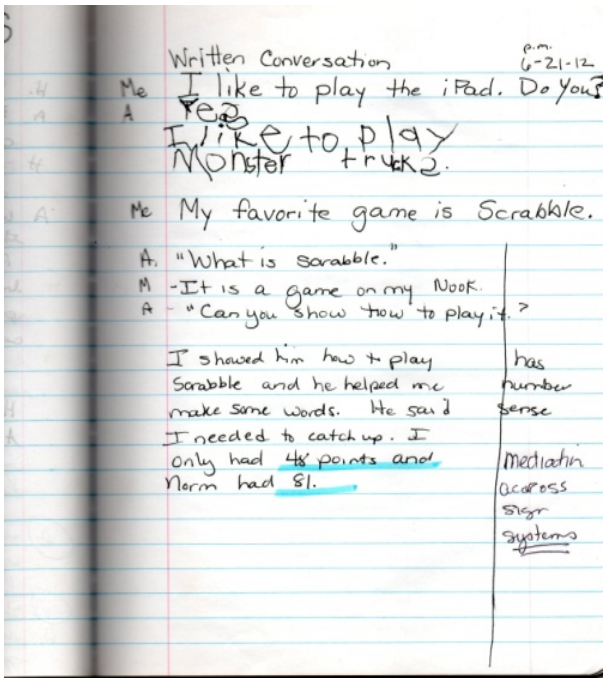

Figure 4.24. Aiden emulated writing during a written conversation.

Madilyn also emulated writing using print materials. Like Makayla, she liked to write in small notebooks just as she had seen me do. On one occasion I was sitting in the den taking notes and she came to me and said, "Nana, can I write?" I gave her a notepad and a pencil and she wrote a note by scribbling on the paper. At times Madilyn emulated Aiden's practice of solving word searches by circling letters in a word search found in one of her coloring books (Figure 4.25).

Figure 4.25. Madilyn emulating Aiden as she tried to solve a word search

Emulating digital practices. In much the same way that the children emulated print-based practices, they also emulated digital practices. As the children saw their parents, grandparents, sitter, teacher, and/or each other using digital tools such as computers, iPad, and smart phones, they too sought engagements with these tools. This allowed the children to learn digital skills and *play their way* into understanding how these tools were used in their worlds. The children emulated digital skills that they saw others use, such turning on devices and swiping the screen from left to right or top to bottom. The children also observed adults as they tapped on icons to select applications, and listened to directives from the devices.

Prior to this study, Aiden and Makayla had experienced more opportunities to engage with digital devices than had Madilyn. Karen expressed in her initial interview that she "hadn't thought much about Madilyn being able to use it [the iPad]" and that she did not have many applications that she thought she might be able to play. This led Karen to select applications that she felt were age appropriate and would engage Madilyn and, as Madilyn was given increased access to the iPad, she began to emulate the digital practices of others.

Madilyn's young age and initiation into digital materials allowed me to see firsthand how one child observed others and experimented with digital materials early in her digital experience as she emulated the actions of members of her family and community. Early in the study, these engagements may have been imitations of the practices of the adults in her world such as swiping at the touch screen or tapping on a computer keyboard or pretending to talk into a play cell phone, but over the data collection period, Madilyn's digital engagements became much more purposeful as she began using digital materials more frequently for entertainment. An example of this was the way that Madilyn learned how to access content on the iPad. One day Madilyn was watching her brother as he played with the iPad. She asked if she could play. Her mother placed the iPad in her lap and we all stood around her watching as if she were about to take her first steps. She tried out some of the moves she had seen Aiden use such as swiping and tapping the screen. Her parents cheered as she took her small fingers and selected the application.

Emulating the use of digital tools for communication. By observing others as they used digital tools, the children recognized that they could be used for

communicating with others and emulated this through play. For example, the girls often talked on toy phones or picked up my own home phone to pretend to talk just as they saw adults do regularly. All the children often asked me to call their mothers or fathers when they spent the night at my house, and member checking confirmed that the children often picked up their parents' phones and tried to place calls by tapping on the number pad. On one occasion while riding in my car, Makayla held the toy phone up to her ear and said, "Daddy, hello, daddy." On another occasion, I had been texting Jenny on my own phone when I saw both girls pretending to do the same on their toy phones. They held their phones out in front of them and tapped the key pads with their index fingers while they looked at the screen.

Throughout the study, Aiden also emulated adult use of digital materials. For example, he often asked me to post photographs on *Facebook* (www.facebook.com) depicting activities that we had done together such as going to the park or going out to eat. Aiden had seen adults post photos on *Faceboo*k, and I speculated that by asking to do this, he was indicating his recognition that others would see the photo or read about what we had done. I did not always follow through with his suggestion in order to maintain the privacy of the participants of this study. However, on one occasion, the three families were out to dinner together and Aiden and Makayla were playing on the iPads. After taking several pictures of them Aiden said, "Nana, you should put that on *Facebook*," which I did (Figure 4.26).

Another example of Aiden emulating the way the adults in his life communicated using digital tools occurred when he created artwork through the use of digital applications. On several occasions Aiden created digital greeting cards and pieces of

artwork on my iPad and saved them to the gallery provided within the application *Nick Jr. Draw & Play* (Nickelodeon, 2012). After Aiden created each drawing, the voice on the application suggested that he ask a grown-up to help him send it in an email, and he did. In early July, Aiden created an eCard within this application and asked me to send it to his parents (Figure 4.27) emulating one way that his parents and I used digital tools to communicate. Aiden had seen his mother and me send emails on numerous occasions; therefore this suggestion was not met with a question about what an email was, but rather, he asked me to help him send this card as an email.

Figure 4.26. A photograph that Aiden asked me to put on *Facebook*

Figure 4.27. The eCard that Aiden created for his parents in *Nick Jr. Draw & Play* (Nickelodeon, 2012) and sent by email

Emulating the use of digital tools for entertainment. The children often saw adults and other children using digital materials to play games or view videos for entertainment. For instance, Aiden's father often played the game *Hay Day* (Supercell, 2012) on the iPad. This application required players to buy and sell produce on a virtual farm. Aiden observed his father playing this game and asked me to download the application on my own iPad so that he could save his games and continue the play whenever he visited that site.

I often played games such as Scrabble and Solitaire on my iPad or Nook. The children observed me as I selected tiles or cards to play these games and at times asked me to let them play. On one occasion I was playing *Scrabble* (Electronic Arts, 2007), an android application that I downloaded on my Nook, and Aiden asked if he could play it. Presuming that the game was too difficult for him, I closed out the game and selected *Chicktionar*y (Blockdot.com, 2011) on the iPad, a game I thought would be easier for him to play. *Chicktionary* allowed Aiden to make words that were in his known writing vocabulary from an array of letters. I felt that this application was more appropriate for him and would allow him to engage in digital play and emulate my use of digital tools for entertainment. In retrospect, my presumption about *Scrabble* being too hard for Aiden may have limited the opportunity for him to fully emulate my use of this application for entertainment.

Using digital toys to emulate digital practices. In the media-saturated culture in which the children in this study lived, many toys served to enculturate them into digital environments with less expensive and more durable versions than the digital devices owned by adults. This was certainly true when it came to the kinds of toys to which the

children had access in home and community settings. Both families and I purchased numerous toys that provided children with opportunities for digital play.

One example was the use of toy phones. Just as their parents often used cell phones for communications and entertainment, the children had toy cell phones which allowed them to pretend to talk on the phone and text others as their parents did. An example of this occurred on one occasion when Madilyn and Makayla spent the night with me. As often happened at bedtime, the girls began asking for their mothers. Madilyn initiated the pretend phone call to her mother using her toy phone. Makayla quickly joined in this imaginative play using her own toy phone to call her mother (Figure 4.28).

Figure 4.28. Madilyn and Makayla emulated communication practices as they talked on their toy cell phones.

Aiden had several electronic tablets designed for young children (the *InnoTab* and the *Leap Pad*) that allowed him to play interactive games and introduced early literacy skills such as color identification, numbers, and letter identification. Some toys allowed the parents to program the digital content. For example, Madilyn and Makayla had stuffed animals (*Leap Frog My Pal*) which could be connected to a computer and

programmed by accessing the manufacturer's website. The programs engaged the children in singing songs that used the children's names and personal interests such as their favorite color or the name of a pet. When the animals' paws were pressed, computer recorded phrases were heard such as, "I love you, Makayla" or "Hi, Madilyn, want to play?"

Makayla also had a toy laptop computer that could be personalized via links to the Internet. Jenny thought about Makayla's personal interests when selecting topics that were then included in the dialogue that was activated when Makayla pressed certain buttons on the toy. When I asked Jenny how she did this, she shared a screen shot of the webpage that allowed her to make her selections (Figure 4.29).

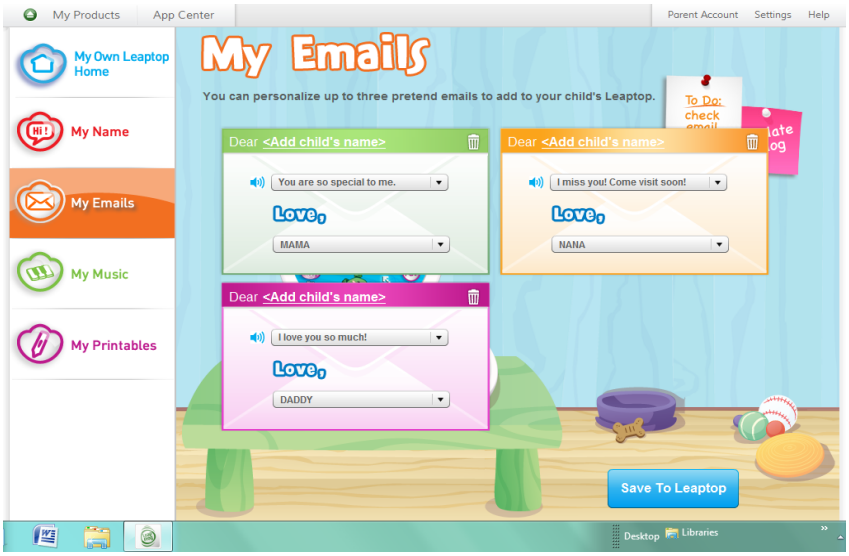

Figure 4.29. A screenshot of Jenny's computer as she programmed Makayla's toy laptop

After the programming was complete, the laptop was personalized for Makayla. The music mode played specific songs that Jenny selected because they were Makayla's personal favorites. Other aspects of the program included an animal mode which, when selected, resulted in a child's voice saying, "Hi, Makayla! Push a letter." When Makayla

selected the letter E, the sound of an elephant was heard. In the Alphabet mode, the name and sound of the letter was heard. When the email option was selected, a voice said, "Makayla, you have an email from Nana. I miss you. Come to visit soon."

Jenny shared that she often encouraged Makayla to play with her toy laptop while Jenny did work to prepare for school on her own laptop (Figure 4.30). Jenny also said that she purchased the toy laptop so that Makayla would not try to tap on the keys of her laptop while she did her schoolwork. She told me that Makayla would often come over to her while she was working on the laptop and say, "My turn!" as she tried to swing the laptop around so that the screen would be facing her.

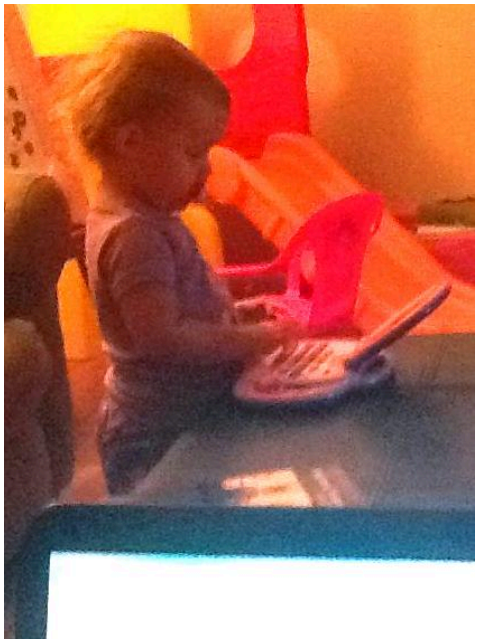

Figure 4.30. Makayla playing on her toy laptop as Jenny used her real laptop

As the study progressed, the children often asked to play games and watch videos on their mother's real cell phone and, more often than not, wanted to engage with real computers or touch screen devices. The digital toys that the children owned allowed them to emulate the adult uses of digital tools in their worlds; however, as Karen expressed, the

children did not seem to want the toy versions of digital materials, "they wanted the real thing.

The Children's Transactions with Print Materials Were Different from Their Transactions with Digital Materials

In many ways, print and digital materials serve some of the same purposes: they each provide information and entertainment, and they allow us to communicate in multiple ways. However, just as I do not use print and digital materials in exactly the same ways, data suggest that the children in this study transacted differently with print and digital materials. Through observations and analysis, I learned that the children's engagements (a) with digital texts were not typically linear, (b) with print-based texts *seemed* primarily linear, (c) with digital texts demonstrated their abilities to persevere, and (d) with print texts resulted in more verbal interactions and greater *visible* emotional involvement.

The Children's Engagements With Digital Texts Were Not Typically Linear

Whereas I tended to perceive the children's engagement with print materials as primarily linear, front to back, left to right, I saw the children visibly engaged with digital materials in a variety of ways which were not necessarily linear. For example, the electronic books (eBooks) the children accessed were not merely print texts in a digital format read cover to cover. Many of the eBooks to which the children had access provided additional opportunities to immediately, with the touch of a button, extend the reading experience through music, movement, and sound effects. Others offered puzzles, coloring sheets, or mazes. In one way, this is actually not very different from young children's transactions with print texts as they connect to story, character, and language in text through spontaneous connections to song, toys, other books, people, and events.

However, the overt behaviors I observed in this study were of children, for the most part, engaging with print texts in linear ways and with digital texts in non-linear ways. Also, the non-linear behavior seemed more directed by the digital device with digital texts and more adult or child-initiated with print texts.

The non-linear qualities of the children's transactions with digital texts were largely possible because of options made available by the use of large buttons (icons) which the children tapped to activate their choices. Their selections were supported by instant auditory and visual confirmation that they had indeed made a choice that would result in some kind of digital engagement or that would lead them to another element in the application. For example, the eBook of *Ladybug Girl* (Penguin Group, 2011) opens with soft music playing while the front cover of the book is displayed. This continues until one of three choices was selected: *Read to Me, Read by Myself, or Lulu's Lots and Lots of Costumes*. Selecting the first option, one hears a pop and the sound of a chime. Once started, one hears a reading of the text accompanied by the strumming of a guitar. Once a two-page spread is read, two red arrows appear. The arrow on the right advances the story to the next page, and the one on the left allows the user to listen to the previous page again. This text had a representation of a small book on the top left corner of the screen which, when tapped, allows the user to return to the home screen. This view also offered a screen view which allowed the viewer to select any scene from the story and go directly to it. In addition, this text offered a virtual paper doll activity that allowed the user to dress the character, Ladybug Girl, in various costumes and place her in different settings. Over the course of the study, the children accessed many of these kinds of

features as they engaged with digital texts. I came to view these different options within digital texts as *layers of engagement*.

I became aware of the way the children accessed many layers of engagements offered by digital tools one day when I was driving into town while Aiden was riding in the backseat using the iPad. I was able to hear the sound from the device which let me know that he had accessed the electronic book, *Meet Biscuit* (Capucilli, 2012). I had engaged with this electronic book on several occasions with the children, so I was aware that it presented a variety of options on the home screen. I listened as Aiden selected the *read to me* option. At one point, I heard a pause in the reading and realized that he had abandoned the *read to me* option to access a different option. Soon I heard the familiar *swik, swik*, and *ding* and knew that Aiden was playing a memory matching game. This game was comprised of eight rectangular boxes and as each box was touched, a picture would appear. The object of the game was to match the cards of scenes from the text with another card just like the first one uncovered. It was a virtual memory match game. I knew Aiden had successfully completed the matching when he was rewarded by the sound of chimes and the character Biscuit barking twice. This is one of many examples of the children interrupting reading the book by switching between options.

On another occasion, Makayla accessed the eBook, *Llama, Llama, Red Pajama* (Penguin Group, 2011). I had purchased this electronic book and downloaded it to my iPad because she had several of the print books in this series and seemed very fond of them. She self-selected the *read to me* feature of the application. At first, she seemed distracted and even somewhat bothered that the characters were moving on the page, but after a few pages, she became intrigued by this movement and at times selected the arrow

to take her back to a certain page to see the characters move again. Besides offering the *read to me* feature, the application also had the option to select any one of the pages by tapping on a small picture of the illustrations of the pages in the text. The illustrations were arranged left to right with multiple rows to capture every page spread, just as they would appear in the order of the print book. This feature allowed Makayla to select her favorite page from the story, repeatedly. In fact, she never completely experienced the book in its entirety due to this feature. While the children saw clear options for ways to engage with these texts, it was very different from the ways I *thought* they experienced print texts.

After seeing Makayla engage with this digital book this way, I expressed a concern to Jenny that Makayla was not accessing this book in a way that I felt would support her growing understanding of narrative story. Looking back, I realize that, even though I knew that transactions with print texts are not linear and that readers access ideas and experiences beyond the printed page, a view of the print reading experience as linear dominated my thinking as I compared digital to print experiences. I showed Jenny how the application allowed Makayla to select any page from the text and hear it read randomly (not in the sequential order of the original text). Jenny reassured me that this did not matter because Makayla was so familiar with the story from having had it read to her repeatedly that she could pick up at any point and understand it. She also reminded me that, as readers, at times we skip around in the text and read it out of order. Having recently read the work of Rushkoff (2013), a media theorist who warned that in our *ever on* society, digital tools might bring about the collapse of narrative story, I viewed Makayla's actions with both curiosity and fear. I was left with a nagging feeling that not

all children who have access to digital texts will develop the same sense of linear story that Makayla had about this particular book. These feelings are explored in Chapter Five as I consider my own learning and in the following section as I question the linear nature of print transactions.

The Children's Engagement With Print Texts *Seemed* Primarily Linear

When engaging with print-based texts both in side-by-side reading and while browsing books independently, the children *seemed* to engage with print in a more linear way than they engaged with digital texts. I draw attention to the word *seemed* because, after a great deal of analysis and writing on my part, I came to recognize that, while I initially saw the children's interactions with print texts as linear, progressing from front to back in sequential story order, they, in fact, experienced print texts in non-linear ways as well.

The linear nature of their print transactions involved them in typically turning pages from right to left, from the beginning to the end of the book without deviating from it. While they would at times linger on a page or turn a page back to check the picture, they did not usually access the book out of linear order. Often this was because the adults in their worlds accessed and demonstrated the use of print texts in linear ways. However, there were also nonlinear elements in the adults' print transactions, instances when, much like accessing digital options, the adults stopped to redirect the children to a connection, a previous page, a song, or another book.

This was best evidenced in a video of a read aloud that Jenny shared on the social media site. Jenny invited Makayla to come to read with her on the couch. Makayla resisted at first, but as Jenny opened the book and began reading, Makayla crawled up on

the couch beside Jenny and leaned in to see the pictures as Jenny read, “A told B and B told C, I’ll meet you at the top of the coconut tree.” Jenny continued to read the text in sequential order. She allowed Makayla to turn the pages for her and stopped periodically on a page to point to letters or make comments such as when she said, “Oh, no, Makayla, they all fell down!” Jenny’s comment to Makayla allowed her to experience more than the written word. Her questions and comments acted much like pushing the non-linear digital button to access a digital question: ’What happened to them?’ Push a button and hear a voice: ‘They all fell down!’ Makayla sat beside Jenny on the couch through the entire reading of the book. When Jenny reached the final page, she reread this page several times as she sang the alphabet song, and Makayla joined in by pointing at certain letters. Once again, this rereading and extending the engagement beyond the printed text allowed Makayla to experience the text in a nonlinear way.

An example of the children experiencing print books in what seemed like a primarily linear fashion but that actually had nonlinear qualities was when I read the book *Dora’s Super Babies!* (Inches, 2006) aloud to Madilyn and Makayla (Figure 4.31). As I often did before reading a book aloud to the children, I allowed the girls to look through the illustrations from the front to the back of the book before I began to read. Drawing on my experience as an educator, I felt that this picture walk allowed the children to see where the story was going before we began reading. These picture walks were usually accompanied by conversations about the pictures before beginning to read. While this practice led me to present the text in linear order before reading, what occurred when I read the text had nonlinear qualities, such as when I stopped on the page in which the character, Swiper, was about to steal the bananas and, going off-script, said, “Swiper, no

more swiping!" On another page, I stopped when characters, Dora, Boots, and the babies were in the bathtub surrounded by bubbles. I pretended to pop the bubbles on the page as I said, "Pop, pop, pop." The two girls joined me by trying to pop the bubbles.

Figure 4.31. Reading aloud to Madilyn and Makayla

Regardless of the nonlinear elements – momentary redirections and connections – that occurred during the reading of print texts, perhaps because the children had experienced numerous read aloud experiences, they often accessed books by starting at the beginning and progressing through the book from front to back in a linear fashion. That is not to say that there were not times when the children abandoned books before reaching the end or began looking at the book by starting with other than the first page. This was exemplified on one occasion when Madilyn self-selected the book, *Elmo's Easy as 1 2 3* (Sesame Workshop, 2006). She sat on the couch and browsed through the book independently for an extended period before she looked up and said, "Look, Nana, look at this book." She had discovered that the book had flaps that she could open and close. Each page in the text provided a detailed illustration of items that could be counted.

While Madilyn turned the pages sequentially from front to back, she randomly accessed the flaps that were found on the page as she explored the many things that could be counted within the text (Figure 4.32)

Figure 4.32. Madilyn as she opened flaps that uncovered additional content the print-based text *Elmo's Easy as 1 2 3*

The Children Exhibited Greater Perseverance as They Explored Digital Materials

The parents confirmed that the children spent a great deal of time engaged with digital applications as if they were determined to master them – they persevered. For example, early in the study, Madilyn did not have the digital skills that Aiden possessed. Karen said, "Madilyn just doesn't have those skills yet. She knows that Aiden knows all about that kind of thing and often just takes his lead." However, this changed as Madilyn refined her digital skills through her willingness to persevere. An example of this perseverance occurred early in the data collection period when Madilyn was learning how to use the touch screen on the iPad for the first time. Her mother realized that she did not have any content that was age appropriate for Madilyn on the iPad. After downloading

several applications designed for toddlers, she demonstrated how to play the game and then handed over control of the iPad to Madilyn. Madilyn went through several attempts to complete the task, looked up at her mother and father on occasion and then returned intently to the task. She was not dissuaded by failed attempts and continued to try again and again until she mastered this skill. Her parents cheered her on as if she had just ridden her bicycle without training wheels for the first time by saying "Yay, Madilyn, you did it!" Madilyn beamed with pride as she realized that she had successfully completed the task in the application. I did not see the same kind of determination and perseverance when the children transacted with print texts.

When I first considered the notion of the children having greater perseverance with digital materials than with print materials, I thought it was related to the stimulation of the movement within the digital devices. In fact, at times I perceived their interactions with digital devices as extremely unfocused as they moved in and out of applications without sticking with one for any extended length of time. However, after observing Aiden on one occasion, I likened this moving in and out of applications to book browsing and came to see it as one way that Aiden made decisions about the applications with which he would then spend longer periods of time –thereby demonstrating perseverance.

On this occasion, I observed Aiden for a twenty-minute period to see how long he would spend on particular applications. Aiden was at the public library using the iPad. He began with some digital browsing, made some decisions, and then persevered with the application that held his interest. This process began as Aiden turned on the device, selected the digital folder which held the art applications and selected *Super Why Paint* (PBS Kids, 2011). He stayed on that application for a few minutes before selecting the

button at the bottom of the iPad taking him back to the home screen. He then opened a second folder that held applications focused on alphabetics and word skills. He selected *Super Why* (PBS Kids, 2011) and then selected one of the characters on the home screen to play "Princess Prestos Wand's Up Writing" game. The application prompted him to select the letter that made a certain sound and then prompted him to trace the letter with his finger. He completed one word (dog) before pressing the back arrow key in the top left corner to take him back to the home screen of the application. Aiden then selected the *Children's Books* folder and the *Mickey Mouse Road Rally* (Disney, 2012) and said "This is just a book." He returned to the home screen, but then went back into the eBook application and allowed the introduction to play until the voice of Mickey Mouse told about a road race. Aiden went back to the home screen and opened the folder that contained his racing applications. He selected the application, *Car Racing* (Hungry Bolo, 2011) and pressed the word *GO* to begin the game. The application responded to this selection with the sound of a car revving up its engine. Aiden controlled the virtual car on the track by leaning the iPad to the left or right. He repeatedly wrecked the car as he ran into other cars which ended the play for that particular race. He responded with, "Oh, man!" When this occurred, he selected *Play Again* and began another race.

I coded this event as an example of Aiden's perseverance with digital texts because, during this session, he explored applications within different folders for an extended period of time and made many strategic moves as he self-selected different digital content. The first several applications with which he engaged appeared to be warm ups for the longer engagement with his favorite racing application with which he remained engaged for 10 full minutes without interruption (Table 4.5). When allowed to

explore and self-select in this way, Aiden would often engage with the iPad for even longer periods of time. As Karen said, "He will play it until you stop him."

Table 4.5.

The Amount of Time Aiden Spent Engaged in Digital Exploration.

Name of Application	**Amount of time spent engaged**	**Observation**
Super Why Paint (PBS Kids, 2011)	2 minutes	Digital browsing: Aiden accessed this app first and spent several minute selecting different tools with which to paint a picture of Super Why, but he abandoned it after two minutes.
Super Why (PBS Kids, 2011)	2 minutes	Digital browsing: Aiden accessed a second Super Why app that had other options for him to practice spelling words. He went back to the home screen several times to select other options within the application.
Mickey's Road Race (Disney, 2011)	3 minutes	Digital browsing: When Aiden opened this app, he said, "This is just a book" and started to go out of it. He then went back in the app for several more minutes.
Car Racing (Hungry Bolo, 2011)	10 minutes	Persevering for extended time: Aiden did not look up from the screen during the full 10 minutes in which he was engaged. He moved his entire body as he controlled the vehicle and maneuvered through the course.

The differences in times spent on each application and his abandonment of applications that held little interest demonstrate Aiden's ability to browse, make choices, and then persevere with one application for an extended period of time once he located an application with which he was willing to stick or that engaged him**.**

Aiden also had several personal favorites to which he returned to over and over. I did not monitor the children's digital engagements every moment we were together during the five months of the study, but a closer look at the play history of one of Aiden's *go-to apps* revealed that he had accessed one application 145 times from the time at which it was downloaded to the end of the data collection period. This revealed a willingness to return to the same content repeatedly and demonstrated perseverance that I

had not seen Aiden demonstrate with print-based materials. A screen shot of the score and achievements page within the application displays the number of games played (Figure 4.33).

Figure 4.33. A screen shot of one of Aiden's favorite applications on the iPad

Perseverance with digital material was demonstrated repeatedly by all of the children. They had remarkable attention spans when they were engaged in self-selected applications in which they were interested. Aiden did not exhibit this same kind of attention span with children's books or other print materials. In fact, there were very few times that I observed Aiden looking through or reading books, with the exception of reading to reach a goal for the summer reading program in the library. While Makayla did remain engaged throughout read alouds early in the study, Jenny shared with me that the days of "the whole sit down and have 20 minutes of completely uninterrupted time [reading to her] just doesn't happen anymore." Similarly, later in the study Karen shared that, when attempting to read from a print book to Madilyn, her daughter "loses interest and wants to play. When she notices I've stopped reading, she swears she was listening from the other room." Karen seemed to feel that Madilyn showed a lack of interest in the

read aloud when she left the room to go play, when in fact Madilyn might have still been listening as she played in the same way adults often listen to a television program from another room.

The Children Engaged in More Verbal Interaction and Demonstrated More *Visible* Emotional Involvement with Print Texts

Although the mothers and I observed that engaging the children in print-based read aloud experiences became increasingly difficult, data repeatedly suggest that the children were more likely to engage in conversation and demonstrate more visible emotional involvement with others when engaged in reading print material than when they were engaged with digital materials.

In spite of the difficulty the parents and I felt in engaging the children with print books, throughout the study, we continued to read aloud to the children from favorite books as much as possible. These read alouds often took place while the children sat close to or in the lap of the adult doing the reading or reading aloud was a part of the children's' bedtime rituals. These bedtime stories were often read by the mothers or fathers, but at times, stories were read to Aiden and Madilyn by their cousin, A'ndrea, or by their other grandparents. My read alouds occasionally occurred at the library, and there were a few occasions when the children asked or allowed me to read to them in my home, but this usually occurred while the children waited on the iPad to charge or when I was tucking them into bed when they spent the night.

Instances when the children did engage with print texts were often connected to favorite stories that had been read many times and that held some kind of emotional connection. Jenny discussed this in her initial interview:

Becky: Does Makayla have a favorite story she likes to have read to her?

Jenny: She loved *Goodnight Moon*, and she loved *Goodnight Gorilla*, but she will not let me read them to her anymore. It's like she burned out on them. But honestly, *Goodnight Moon* calms her. If I recite a few lines from it, it will calm her down. It's like it brings her back to a calmer place in her memories, but as far as letting me read *Goodnight Moon* to her, she doesn't let me do that anymore…her favorite book right now is *Llama, Llama Red Pajama*. She calls it the "Mama" book...she knows how that story goes.

These books often brought out emotional responses and verbal interactions between Makayla and her mother. It was during the observation of Jenny reading *Llama, Llama Red Pajama* (Dewdney, 2005) aloud to Makayla that I noticed the emotional involvement Makayla displayed during read alouds. She obviously knew the story well because it had been read to her repeatedly. This was demonstrated by her ability to anticipate when to turn the pages and her ability to chime in with text language throughout the story. She interacted verbally by pointing to pictures within the text and named actions and objects such as "drink" and "baby."

In the same reading, Makayla displayed emotional reactions to the dilemmas the character faced. As Jenny read "Llama, llama red pajama listens, quiet, for his mama," Makayla put her finger over her mouth and said, "Shhhhh." She then turned to look her mother in the eyes and said, "Shhhh!" Throughout this read aloud, she turned to look at her mother, as if to check Jenny's reactions to the text. She demonstrated how emotionally invested she was in this character as she pretended to cry along with Baby Llama. As Jenny read, "What if Mama Llama's gone?" Makayla shouted, "No!" She further displayed her love for this book as she hugged it to herself after her mother completed the read aloud.

It is important to note that Makayla's very verbal, interactive response to this text contrasted sharply with the way she experienced this same story in the digital format at a later time. When presented with this same text in a digital format, Makayla first refused to listen to the story. When I offered to let her listen to the story or read it to her myself, she quickly selected the button on the iPad that took her back to the home screen and selected *Dora Dress Up* (Nickelodeon, 2012). Makayla did eventually allow me to play the *read to me* feature, but her reaction to the text in a digital format was very different from the interactive read aloud that she had experienced as her mother read the story aloud. This will be discussed in an additional finding.

An anomaly in the data occurred following the read aloud of *Llama Llama Red Pajama*, as Makayla selected another Llama, Llama book that she had in her collection, *Llama Llama, Mad at Mama* (Dewdney, 2007). Jenny shared with me that Makayla had never allowed her to finish reading this book because she got upset when the main character got in trouble. I considered this experience an anomaly because the reading of this particular book did not lead to greater verbal interactions by Makayla. I speculated that this was because of the emotional response the text evoked in her. As Jenny opened the book, Makayla sat stock still, as if she were frozen in place. She did not touch this book or say anything as Jenny began reading, "First the shopping, then a treat. Mama Llama gets a seat…" Makayla looked back and forth across the picture, but never moved to touch the book or make a sound until Jenny read, "Flying pasta, spraying juice. Paper towels rolling loose. Coffee, bread, and chips galore. Shoes and sweaters hit the floor." Makayla responded by saying, "Ugh!" as she put both of her hands up beside her head, covered her eyes and looked back at her mother for the first time. She called out,

"Mama!" as she turned over to put her head down on Jenny's shoulder. She wriggled out of Jenny's lap and called out, "Nana, Nana" as she looked back at the book. I interpreted this as an appeal for me to put a stop to this, and I speculated that Makayla had reached a point of emotional discomfort and that she was not willing to continue to listen to the read aloud. Later in the study, Jenny also speculated about Makayla's emotional reaction to the book when she said:

> I wonder now if my voice inflection when Llama Llama did get in trouble is what scared her about when I read that book and she likened it to me fussing at her. Now she can compartmentalize that the book is about that character and what he has done, and that Mamma is not mad at Makayla

After the impromptu video-taping of this read aloud, I let Makayla and her mother view it on the screen of my smart phone (Figure 4.34). Makayla watched this intently until the video reached the reading of *Llama, Llama, Mad at Mama* (Dewdney, 2007), at which time she decided to abandon the viewing at exactly the same time that she had in the original reading. She slipped down from her mother's lap and walked away. Just as the original transaction with the text had caused Makayla to experience an emotional response that she found to be unpleasant enough to abandon the read aloud experience with her mother, viewing the video of the read aloud elicited the same response from her.

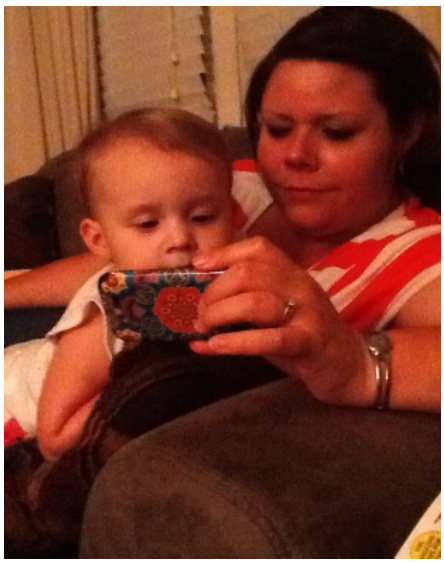

Figure 4.34. Makayla and her mother as they watched a video of Jenny reading aloud to Makayla

When Engaged With Digital Materials, the Children Often Chose Not to Engage with Others

When the children were engaged with digital materials, they often did not engage verbally with the members of their family or me. This intense focus on digital tools led to many repeated instances in which the children were very quiet for extended periods of time. Much like Turkle (2010), who wrote about ways that technology leads us to be *alone together*, these children became so engrossed in their digital play that they, at times, seemed to find it difficult to *pull themselves out* of the play to acknowledge the presence of others or to engage in conversations. This led to tensions within the families as the children often refused to respond when their parents spoke to them. Through ongoing reflection and analysis of data, I learned that (a) while engaged with digital materials, the children often did not engage in verbal conversations with people who were physically present (b) often focused in verbal silence as they used digital devices.

While engaged with digital materials, the children often did not engage in verbal conversations with people who were physically present. Engagements with digital devices consumed a great deal of the children's time spent with family members. In addition to the children's involvement with digital materials, I often observed the adults, including me, engaged with some form of digital materials. At times, these digital interactions reflected the same kinds of interactions I observed when the children and adults engaged with print texts. By this, I mean that there were times when adults and children *engaged together* with a device, *talked to each other*, and *demonstrated or discussed* the content. However, more typically, the adults and the children sat side-by-side and were quiet, separated by their own transactions with their digital devices. Extending the findings of Turkle (2010), I came to view these side-by-side digital engagements as being *together alone*. For example, on one occasion I observed Jenny and Makayla as they sat side-by-side. Jenny read from the iPad and Makayla was engaged with her pretend phone. My sister-in-law, Jenny's Aunt Marge was just out of view and worked on her laptop computer (Figure 4.35).

Figure 4.35. Jenny and Makayla engaged with digital devices

Lack of responsiveness when engaging with digital materials. I tried on many occasions to informally interview the children as they used digital devices. I often asked them what they were playing which was usually answered with either silence or a quick, "Nothing, just a game." I even resorted to downloading new applications in hopes that the children would ask questions or seek support from me as they attempted to play the games. On one occasion when Aiden noticed that I had added a new game to the iPad, he said, "I see you got a new game." However, that was as much of response as I got from him. All the children seemed quite content to sit quietly and explore applications without my input or the need to discuss their play. The children were often so engrossed in their play that they did not seem to be aware that I was in the room with them. An example of this comes from one occasion when I questioned Aiden about the racing game he had been playing for an extended period of time:

Becky: I want to ask you a few questions about the iPad. Ok?

Aiden: (no response)

Becky: Why do you like playing it so much? Stop playing it a minute and let's talk. Look at me.

Aiden: (Without looking up, he shrugged his shoulders and kept playing the racing game he had been playing.)

It was not typical of Aiden to be this unresponsive to my questions. He was usually quite talkative and we often had long discussions about things he was learning about the world, but when he was engrossed in a digital game, he was much less likely to carry on a conversation. Madilyn and Makayla were also less likely to engage in conversations with people who were present while they engaged with digital materials.

On one occasion, Makayla was playing the application *Super Why* (PBS Kids, 2012) on the iPad and I asked her repeatedly to tell me what she was playing. I asked her the names of the characters to try to elicit some response. She never looked up from the device to even acknowledge that I was speaking to her. She selected the button on the iPad to return to the home menu and selected a different character, which led to a different activity. She tapped on the screen of the iPad and occasionally looked up at me, but never spoke a word. There were repeated instances when Madilyn also remained in deep concentration while using digital materials and refused to engage in conversation with others.

The use of separate digital devices led to separate engagements and fewer conversations. While the children often sat side-by-side using digital devices; there was little conversation with each other about what they were doing. Video recordings of these events were often void of human voices with only the background sound of the music that accompanied most of the applications with which the children engaged. As the children sat spellbound within digital play, the backlight of the device created a glow on their faces. I termed this the *digital glow*. Since I often collected data when the children were spending the night with me, there were numerous occasions when I photographed or videoed them at night which made this digital glow even more apparent. It became quite common to see Aiden and Madilyn sitting side-by-side on the couch, faces illuminated by the glow of the screen, and expressions frozen in deep concentration as they engaged in separate digital play side-by-side (Figure 4.36).

Figure 4.36. Aiden and Madilyn engaged in separate play on separate devices

This could be likened to *parallel play* in which children engage in play of all kinds in the same space as another child without interacting with the other child. However, the children's digital engagements were not perceived in this way by the adults in the study. One of the biggest complaints I heard from the parents was the way the children went into, what the parents saw as, an almost trance-like state when engaged with digital devices. The parent's reactions to this are discussed further in Chapter Five. Whether it was trance-like or not, if the children were each provided with their own devices, then they engaged in separate activities. This was exemplified by one occasion in which a small tripod set up on the back of the passenger seat of my car and captured a video tape of the way Aiden and Madilyn used digital materials while I drove to town (Figure 4.37).

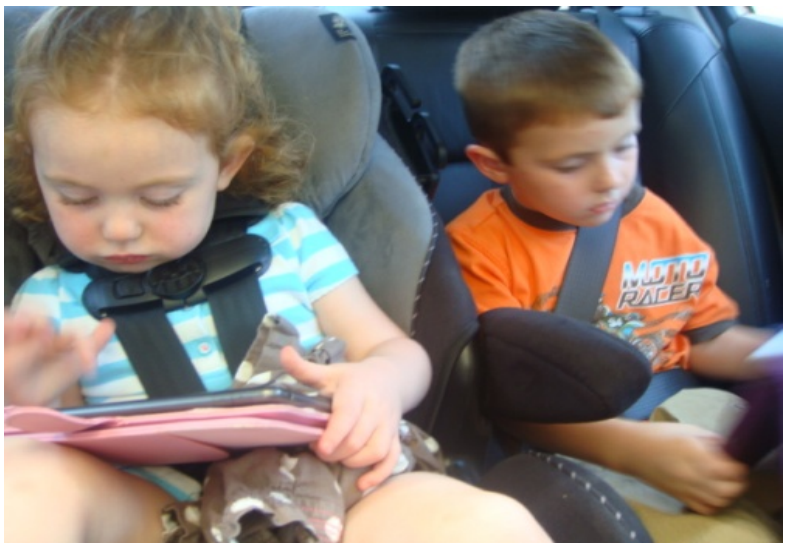

Figure 4.37. Aiden on the iPad and Madilyn on the Nook while in my car

On this occasion, Aiden and Madilyn rode buckled up in car seats in the backseat while I drove. Aiden had asked me if he could play my iPad as soon as he got in the car. Madilyn parroted him by saying, "Nana, can I play your iPad?" I offered her my Nook instead and they both turned on the devices and self-selected an application. I heard the familiar sound of the music that accompanied *Dora's Dress-Up Adventure* at the same time that I heard the revving of car engines. From these sounds, I knew the children were playing separate games, but the children remained quietly engrossed in their individual play as they accessed the separate devices, never glancing way from the screens. It struck me that these might be the same behaviors one would observe if two children were engrossed in separate print books, but I did not observe that kind of print engagement as I observed the children in this study.

Repeatedly, when there were two devices present, the children engaged with different self-selected applications and remained completely engaged on their own. This was also often the case when one child used the iPad and one was on the Nook or when

the children sat at the literacy computers in the library. An example occurred one day when I took Madilyn and Aiden to the public library for the afternoon. Madilyn asked to use the iPad and Aiden used the Nook for about 15 minutes. The children self-selected numerous applications during this time without any interaction or conversation between the two of them.

The use of headphones led to even fewer opportunities for conversation. While the children had a tendency not to engage in conversation while engaged in digital play, this became even more pronounced when headphones and earphones were introduced. I first became aware of this when the children used the literacy computers in the public library. In order to prevent the sound from the computers from disturbing those working or reading in the library, both computers had headphones that the children were required to wear while engaged with the computer. This requirement presented several problems. First, it prevented the children from interacting with each other on the computer since only one child at a time could wear the headphones. For example, on one occasion Aiden and Madilyn shared the use of one of the literacy computers in the library. Aiden had the headphones on, but Madilyn held onto and controlled the mouse (Figure 4.38). She was totally unaware of what she needed to do to control the play based on the verbal cues in the application because she could not hear the commentator within the application. In this way, the headphones caused them to be even less responsive to each other.

Figure 4.38. Aiden and Madilyn on the literacy computer; one child was wearing the headphones and one child was controlling the mouse

My inability to hear what the children heard also presented a problem as I tried to mediate their play on this device because I did not know what the children were directed to do. Therefore, there was no way for me to support them as they tried to maneuver the mouse to control an application. The headphones served to close off my access to their content and the processes of their engagement. When the children required assistance, they pulled off the headphones to talk to me.

Another example of headphones closing down opportunities for interaction occurred one evening while Aiden was spending the night at my house. He had spent most of the evening engaged with a new digital racing game. The sounds from the iPad game began to interfere with my husband's attempts to view television or read from his Nook. When my husband asked Aiden to turn the games down, the lack of sound seemed to interfere in Aiden's ability to play the game, so I offered a set of earphones. What I

had not anticipated was how this cut Aiden off from engaging with the rest of the family, or how it prevented me from hearing the kinds of engagements he had on the iPad.

The Children Transmediated and Transferred Skills Across Print and Digital Materials

Transmediation conceptually labels the way that human beings respond to cultural texts through multiple sign systems which lead us to deeper meaning making (Siegel, 1995). Analysis of my data draws on and extends the work of others who have explored transmediation within multimedia (Gee, 2011; Lankshear & Knobel, 2008: Leu et al, 2004; Whitmore, et al., 2005) as I extrapolated the concept to encompass the use of websites, podcasts, programs and applications, and videos. As the children in this study engaged with print and digital materials, their transactions were often transmediated through and across multiple forms of communication: movement, creative dramatics, music, drawing and numerical representations. As an educator, I was aware of the value of transmediation as a means of expanding on the ways that school-aged children extend and demonstrate their ways of knowing, but through this study, I came to see transmediation as a means of extending meaning making for very young children as well.

Through my observations, ongoing analysis, and returning to the literature, I learned about the ways in which these children transmediated across print and digital materials, often taking schema from one literacy event and applying it in new situations. Testing this transferability was commonly observed throughout the data collection period and provided me with insights into how the children were growing into understandings about 21st century literacies. The children transmediated in both print and digital spaces, often melding what they knew about digital materials and attempting to apply that knowledge to print based texts or other technology. Likewise, the children blended

growing skill sets from both print and digital environments as they used the computer and iPad. This could also be viewed as the children using their expertise to draw syncretically on multiple areas of knowledge and skill (Gregory, Long, & Volk, 2004), to create new ways of transacting with both print and digital texts. The children engaged in syncretic behaviors and transmediation as they told me stories about the pictures they created in digital applications, sang songs about books they read, and acted out stories through dramatic play. As the children drew meaning from one sign system to another through transmediation, they deepened their abilities to engage and consequently, their literacy learning.

Transmediation and print texts. I first noticed acts of transmediation very early in the study. I took Makayla to the library where she sat at the computer, tapped on the keyboard, and moved the mouse around. She then went to a wire book display that held young adult novels, and selected one with a shiny pink cover. She returned to the computer chair and began to turn the book over and inspect it. She turned to the book's back cover and tapped on it as she would the iPad. What intrigued me about this was that Makayla was applying what she knew about digital materials to a print-based medium. When she did not get a response from the novel, she put the book down and picked up a compact disc that she had self-selected from the video holding in the library. She touched the case to the side of the computer as if she expected the movie to play. She tapped the video to the computer repeatedly and then looked up at me and said, "Dora." Makayla further exemplified transference when she tried to select the pictures of the other Dora books in a series that were printed on the back cover of *Dora's Camping Trip* (Wax, 2011). Jenny said that Makayla became very upset when her attempts to access content

as she tapped on the book did not provide her with the new books she saw on the back cover.

Transmediation and digital texts. The children demonstrated transmediation within digital materials in many ways. One was as they *read* icons and accessed digital content. I italicized the word *read* to draw attention to the way that digital tools use icons as signs that were indeed read by the children. Even Makayla, who was only two at the time of this study, read the icons available on the iPad and was able to access her desired content and enter into literacy engagements. Because she could read the icons, she could find the folder in which her apps were stored and could self-select apps based on the icons that represented each application. At one point I thought Makayla might be randomly selecting applications. I was proven wrong when I repeatedly selected the button that would return the device to the home screen. I then advanced to another home screen that held additional folders with other digital content and turned the device off. When I gave Makayla the iPad, she promptly turned the device back on, swiped to the home screen that held her folder of toddler applications and selected *Dora's Dress Up Adventure* (Nickelodeon, 2012), the application she had originally selected. The application was identifiable by a picture of Dora in a pirate hat. Makayla read this icon and knew that it was connected to the content within which she wanted to engage.

On another occasion, Makayla demonstrated transmediation between print and digital texts as Jenny read *Chicka Chicka Boom Boom* (Martin & Archambault, 1989) aloud to her. When Jenny reached the end of the book, there was a full page display of the alphabet. Makayla began to rock and to sing the alphabet song, but it was not the familiar tune that I knew. It was the alphabet song that Super Why sang on television and

on the applications that I had on my iPad, *Super Why ABC* (PBS Kids, 2012). Makayla rocked back and forth in rhythm as she and her mother sang the song. When they reached the end of the song, Jenny sang the words, "Come sing with me." Makayla joined in loudly singing, "Me!" and pointed to her own chest. Makayla had transmediated between print and digital media as she connected the print letters she saw in the print book to a song she had learned through a digital text.

The children also transmediated as they accessed digital books that offered layers of engagements. For example, on one occasion, Madilyn accessed the eBook *Meet Biscuit* (Capucilli, 2012). She selected the *read to me* feature of this eBook and listened as it was read aloud. After hearing the text read aloud, she returned to the home screen and accessed the sticker book option in the application. She created a drawing by selecting images of characters from the story. This activity allowed Madilyn to transmediate between the text she had heard and the drawing that she created within the application. This provided an opportunity for her to extend her thinking through visual images as she recreated scenes from the book.

Testing transferability of emerging skills. Transmediation was most obviously recognized as the children tested the transferability of skill sets across media. This was, at times, much to my surprise as the children sometimes tried to transfer digital skills to other forms of digital technology. An example of this occurred one day as Madilyn was watching an episode of *Dora the Explorer* (Nick Jr., 2012) on the television in my home office. On this occasion, Madilyn interacted with the television as she watched the cartoon which encouraged active participation by asking questions and then waiting for viewers to respond. While viewing this television show, Madilyn often answered the

questions by speaking out loud directing her response to the television. During this episode, the character, Dora also asked viewers which button she should select on her computer, and Madilyn reached to select the button on the television screen and attempted to transfer her touch screen skills to the television screen. Madilyn was not discouraged by the lack of response from the television screen; she just continued to tap until Dora confirmed that she had indeed selected the correct response (Figure 4.39).

Figure 4.39. Madilyn trying to apply her touch screen digital skills to the television screen

While Aiden was the oldest of the three children and further along in his conceptual understanding of technology, he also attempted to transfer what he knew about one technology to another. An example of this occurred on one occasion when all of the children were spending the night at my house. Madilyn asked to watch an episode of *Dora the Explorer* (Nickelodeon, 2012). Several episodes of Dora were available through the On Demand feature of my television, and after I searched through the menu and found one, I pulled an episode up for her to view. The screen showed a large button that was supposed to be selected using the remote control, but Aiden (attempting to help

Madilyn) reached to touch the button as if the television would be responsive to his touch. When he realized what he had done, he said, “Nana, you need to get a touch screen television.

Yet another example of the ways the children attempted to transfer skills occurred one evening as my husband Henry read an eBook on his Nook. Henry had been reading from his book for quite a while when Makayla walked over to him and grabbed his Nook from his hand and said, "My turn!" She looked at the screen and tapped on the bottom of the devise. Then she cocked her head to the side with a puzzled look on her face. Henry's Nook was a black and white eReader, and the only content on it was the digital versions of print-based novels. It did not have touch screen technology and the pages had to be advanced through the use of small buttons on the side of the device. Makayla swiped her right index finger across the screen, touched her nose to the screen, and looked into the device. She tapped on the screen several times as if she were trying to activate it. When the device did not light up with color or do anything that she anticipated, she handed it back to Henry and went back to her play. Makayla had tried to apply her touch screen schema to the new device and it did not work as she had anticipated.

The Children Responded to both Intrinsic and Extrinsic Rewards Offered by Engagement with Print and Digital Materials

My analysis of data suggests that the children responded to intrinsic and extrinsic rewards as they engaged with both print and digital materials. I first began thinking about the ways the children responded to rewards one day while visiting the public library with Aiden and Madilyn. The library offered a summer reading rewards program designed to encourage the children to read or be read to over the summer. On one occasion, I watched as Aiden and Madilyn went to the counter to collect the light-up ring

they earned for reading (or being read) 10 books. I wrote in my field notes, "What keeps the children motivated in digital play?" As I reflected on this question, I also considered what kept the children motivated to engage with print texts. As I considered these questions and my data, I learned that the children were often motivated to read or engage with print material by (a) intrinsic and extrinsic rewards in home settings and (b) by extrinsic rewards in the library, and (c) to engage with digital materials because of both intrinsic and external digital rewards.

Intrinsic and Extrinsic Rewards in Home Settings

Throughout the study, the mothers shared ways that the children experienced print books during read alouds or through independent book browsing. Data suggests that these experiences provided the children with both intrinsic and extrinsic rewards. The children enjoyed emotional rewards they received as they engaged with their parents during print experiences at home. This was best exemplified by several videos that the mothers posted of them reading aloud to their daughters. It was apparent in these videos and in my observations at home that the children were rewarded by the close physical connection of sitting in their mother's laps or close beside them during read alouds. They also seemed to be rewarded in the ways their mother expressed emotion using voice intonation in their reading.

This was demonstrated on one occasion when Jenny read aloud to Makayla from the print-based text *Chicka Chicka Boom Boom* (Martin & Archambault, 1989), one of Makayla's favorite stories. Jenny sat on the couch with several books beside her. She invited Makayla to join her, "Come on, Makayla, Let's read a book." Jenny held up several titles and asked, "Makayla, what books do you want to read?" Makayla walked

over to Jenny and said, “Boom, Boom” as she pulled the book, *Chicka Chicka Boom Boom* from Jenny’s hand. Then she let go of it and said, “No” and walked toward Jenny with her left arm flayed up in the air as she dragged her blanket in her right hand and said, “Pap, Pap.” She wanted her pacifier. Jenny reassured her saying, “We will get pap pap in a minute, come here.” Jenny picked Makayla up and sat her on the couch to her left, opened to the first page of *Chicka Chicka Boom Boom* and said, “Let’s read Boom Boom.” Makayla pulled away from her mother and protested momentarily with a shrill, “No!” but was visibly pulled into the book (she turned toward it) as Jenny began to read, “A told B and B told C,” Makayla became quiet and leaned over to look at the pictures as her mother continued to read. Her entire demeanor changed as Jenny read, “Weeee!” Makayla looked at her mother, leaned her head toward Jenny, smiled, and repeated, “Weee!” Jenny responded to this display of emotion by touching her forehead to Makayla’s forehead.

As the read aloud continued, there was no further sign of grumpiness or emotional distress from Makayla. At times, she rocked her left leg back and forth with the rhythm of the words as Jenny read them. On the last page, Jenny asked Makayla to join her as she sang the Alphabet song. Makayla pointed to the lowercase e and said, “Baby e.” Jenny responded with a nod and said, “Very good” as she closed the book. This verbal response seemed to serve as an extrinsic reward. I also interpreted the lilt of Jenny’s voice and the rhythmic reading of a familiar text as a kind intrinsic, emotional reward that brought comfort to Makayla. Jenny shared that she often read to Makayla to calm her. In fact, she stated in an interview that, at times she would recite only a few lines from a familiar text such as *Goodnight Moon* (Brown, 1947) and Makayla would become calmer: “If I recite

a few lines from it, it calms her down. I don't know if it just takes her back to a calmer time in her memory or what."

Another example of rewards the children received related to their interactions with print based texts occurred when Karen read *Into the Tub* (Beaver & Nolan, 2004) to Madilyn one evening just after she had taken a bath. Karen and Madilyn sat side-by-side on the couch, wrapped in a blanket. Madilyn was nestled under Karen's left arm and leaned against her mother. She followed along as Karen began to read. As Karen read, "Now it's time to dry off; it's getting real late. You must be in bed before the clock strikes eight." Madilyn glanced up at her mother's face and smiled. This emotional connection between Karen and Madilyn provided both extrinsic (physical contact) and intrinsic (emotional security) rewards. Even the intonation of Karen's voice potentially provided rewards for Madilyn as she engaged in this read aloud experience (Figure 4.40).

Figure 4.40. Karen reading aloud to Madilyn in her home

Although I do not have data demonstrating Aiden experiencing rewards when reading print based books with his family, Karen confirmed that she often read to Aiden and Madilyn together in the evening and that Jason (Aiden's father) often read to him as well. Karen shared that Aiden enjoyed looking through books with his father to try to find sight words that he knew which provided both intrinsic rewards because of the time Aiden spent with his father and the satisfaction of being able to recognize and read high-frequency words.

Extrinsic Rewards in the Library

Just as the children were motivated to read or be read to by intrinsic and extrinsic rewards with regard to print-based materials at home, they were also motivated by rewards in other contexts, particularly at the public library. However, over the course of the study, I found that this motivation to read or be read to at the library varied among the children. Aiden was particularly motivated to engage with print books because the public library in our town offered a summer reading program through which children could earn rewards/prizes for reading books. Actually, it was not until Aiden learned of this reward program that I was able to entice him to even look through books with me at the library. As Aiden began to receive these tangible rewards, Madilyn also wanted to read books to earn rewards.

Aiden first learned of this rewards program one day when, after arriving at the library, I explained the summer reading program telling him that he could get prizes each time he read 10 books. He responded by saying, "Okay, let's go get some books!" Aiden walked to the paperback rack and selected 10 titles and thumbed through several of them. I told him that we would check them out and when we brought them back we would write

down the titles and he would get his prize. Aiden asked, “Can’t you read them to me right now so I can go get my prize?” I told him that he could read some of them himself and his mom and dad could read to him as well.

When we returned to the library the following week, Aiden and I filled out the record of the books that he had read at home. When the list was completed, he walked to the circulation desk on his own, handed the attendant the list of books he had read, and waited for his reward (Figure 4.41)

Figure 4.41. Aiden as he waited to receive his reward for reading 10 books

As soon as Aiden received his reward, he asked me if he could get more books. He returned to the paperback rack that held numerous titles of books about characters that were familiar to him such as Sponge Bob and Dora. He selected the books he wanted to check out. I was excited that Aiden showed more interest in getting books as a result of the summer reading program. The last book he selected was a dinosaur book; he thumbed through it, tossed it over to me and said, “Dino Rush has a volcano level.” At first I did not understand what he meant by this comment, so I asked him what he meant. He said, “You know, *Dino Rush* on the iPad. It has a volcano level.” I realized that Aiden had made a connection between the dinosaur book he had selected and one of the games he

enjoyed playing on the iPad *Dino Rush* (Nemoid, 2012). He then asked me if he could play with the iPad.

Aiden's comment and the way he had tossed the dinosaur book toward me made me wonder whether or not he experienced the same kind of reward from reading the books he selected for the summer reading program as received when he played the volcano level of *Dino Rush*. I also thought it was interesting that the children participating in this rewards program did not receive rewards for watching videos, playing on the literacy computer, or reading digital books. In fact, the public library in our town did not have an electronic holding for children or adults available at the time of the study other than the eBooks that were on the literacy computer.

Intrinsic and External Rewards with Digital Materials

Many of the applications that the children self-selected as they used digital tools offered ongoing rewards as well as culminating rewards when a certain level of play was achieved. For example, one of Aiden's favorite applications, *Jake's Never land Adventures* (Disney, 2012) provided ongoing verbal cues, which were a form of reward. The familiar voice of Dora the Explorer encouraged Madilyn and Makayla as they accessed *Dora's Dress Up Adventure* (Nickelodeon, 2012) offering constructive feedback and verbal rewards as the children progressed in the play such as, "Look out!" or "Way to go!"

These rewards held several advantages over the rewards offered at the library for reading print-based texts. With the digital rewards, the children did not have to complete and record a designated number of engagements, the rewards did not require interaction with adults, and the rewards did not occur only at the end of the children's transaction

with the text but served as ongoing motivators for the children throughout their engagement with any one application.

Digital certificates. I first became aware of the ways that digital rewards served as ongoing motivators for the children when Aiden saved a digital certificate he earned on the *Jake's Neverland Pirate School* (Disney, 2012) application to the photo gallery of my iPad. This application required Aiden to navigate multiple levels of performance designed to practice digital concepts such as the control of forward motion, the use of the touch screen, and the ability to activate play as he tapped the screen. These competencies had to be demonstrated before the player reached the certificate level. Aiden quickly mastered this application, but he often self-selected it even after he had earned his certificate. I was surprised when I discovered that Aiden had self-selected a photograph of himself from my gallery to insert in the certificate before saving it (Figure 4.42).

Figure 4.42. The certificate Aiden received when he mastered all of the levels on *Jake's Never Land Pirate School* (Disney, 2012).

Music and sound effects as digital rewards. With the exception of the drawing application and a few electronic books, almost all of the applications marketed for children that I downloaded on my iPad provided music to underscore the rhythm of the digital play. Many of the applications also had sound effects that played at certain times and acted to reinforce the play. I noticed that the children responded to the music and sound effects and that the music served as a kind of reward when their moves were successful within the applications. Many times, when the children were successful, upbeat music was played and the sound of flat, honking horns let them know a wrong move had been made.

This was most apparent in the racing applications that Aiden often played. As he accelerated the forward motion of the cars or trucks in these applications, the music would reach a feverish crescendo, and as he approached dangerous obstacles, the music would decrescendo. These music cues served as both rewards and an additional way of mediating Aiden's play and controlled the intended engagements as he played with the application.

Another example of music as a reward occurred when Madilyn transacted with the iPad application *Amazing Match* (Joy Preschool Games, 2012). The application is a memory match game in which the player turns over cards. When the matching card is located, the card disappears. On this occasion, Madilyn selected the picture of the animal on the main screen. A set of eight cards appeared on the screen and she randomly selected a card. The card turned over and displayed a dog and the sound of a dog barking was heard. When Madilyn selected the next card, a sheep, the sound of the sheep bleating was heard at the same time as the sound of two blasts of a horn which indicated that the

cards did not match. When she successfully matched the two pictures of cows, a soft chime played along with the sound of the cows mooing. The picture of the animal was then displayed in the center of the screen and the name of the animal was printed below it. Madilyn continued in this play until she successfully matched all eight cards and was rewarded by the sound of a man's voice saying, "Amazing!"

The Children Were Both Experts and Apprentices within Print and Digital Environments

Data repeatedly suggest that the children moved in and out of the roles of expert and apprentice (Rogoff, 1990) with each other, peers, and adults within both print and digital environments. These findings support the work of Vygotsky (1976) who posited that learning is social and occurs as new knowledge is mediated by interactions with others. My findings also support the work of Rogoff (1990, 2003) who found that learners move in and out of the role of *expert* in a kind of *apprenticeship* to learning new skills**.** The children in this study consistently moved in and out of the role of expert and age did not determine who took on that role. Throughout the study, the children demonstrated a willingness to share these roles as I learned that they (a) often acted as apprentices when engaged with print materials, (b) were more likely to take on the role of expert in digital spaces, (c) accepted and benefited from other children in the role of expert, and (d) experienced digital tools as experts.

The Children as Apprentices When Engaged With Print Materials

The children often acted as apprentices when they used print materials, particularly in the company of adults. This was demonstrated when the children engaged with books with their mothers and me. While they sometimes took on the role of expert when reading books or drawing with each other, they seemed to see the adults as primary

experts when it came to reading books. Aiden seemed to feel this in particular, indicating often that he "could not read yet."

The children demonstrated that they saw themselves as print apprentices as they made observations of the reading behavior of others. An example of this occurred on one occasion when Madilyn was at the public library. She observed an older child who had selected several books and sat quietly reading. Madilyn went to the bookshelves and selected several books and sat down at a near-by table. As she began to browse through one of the books, she looked up as if she were comparing her moves to the other child's moves. She slowly turned the pages and continued to glance at the other child. Madilyn had vicariously acted as an apprentice to a reader she seemed to perceive as more expert.

Additionally, the children's apprenticeship behaviors were typically exhibited when they sat beside or in the adult's lap for book reading and allowed the adult to hold the book (Figure 4.43). At times they would help to turn the pages and point at objects or letters on the pages, and at other times they allowed the adult to turn the pages. As apprentices, the children learned many concepts of print such as turning pages and recognizing that pictures help to tell the story, but they appeared to see themselves in the apprentice role.

Figure 4.43. Makayla sat in my lap as I held the book and read to her

In spite of Aiden's view that he lacked expertise as a reader, there were times when he enacted the expert role with Madilyn and Makayla as apprentices. This was best exemplified when Aiden read to the girls. On one occasion, he sat between the two girls and read *The Big Red Book* (Crayola, 2010) and pointed out objects in the illustrations such as a strawberry, a stop sign, and a fire engine. I had read the book to the children before, and Aiden read the story by generating his own words (Figure 4.44). The girls listened attentively and looked at the illustrations with him. As he asked, "What do you see that is red?" Madilyn responded by saying, "I see that red car." In this way, Aiden had acted as the expert and the girls apprenticed to him as they observed his reading behaviors while interacting with the book.

Figure 4.44. Aiden as he acted as the expert by reading aloud to Madilyn and Makayla

The Children as Experts When Engaged with Digital Materials

In contrast to their role with print texts, the children frequently took on the role of expert when using digital materials. This was repeatedly demonstrated as they offered assistance to adults, each other, and to other children while engaged with digital materials

supporting Prensky's (2005) notion that children today are digital natives, extremely adept in the use of digital materials. Both Aiden and Madilyn demonstrated this, but it was particularly true of Aiden who became the resident expert when it came to technology. Karen even referred to him as "Mr. Technology" and said that Madilyn recognized his expertise and often went to him for help with digital materials.

Aiden often provided Madilyn and Makayla with demonstrations about how to access or play games on the iPad. Madilyn was often heard appealing to Aiden to "fix it" when she would reach an impasse within a particular application. Aiden took on the role of expert as he provided demonstrations and then monitored the gradual release of responsibility to Madilyn or Makayla. He seemed to know just how much help he could offer without causing Madilyn to object to him taking over her device. This was demonstrated as he leaned toward her in order to see the screen and tap on the screen to solve the problem she had encountered, all while allowing her to retain control of holding the device (Figure 4.45).

Figure 4.45. Aiden providing Madilyn help on an application

Madilyn sometimes took on the role of expert with her grandfather. My husband, Henry, was not particularly adept or interested in the use of digital tools, but he was willing to allow the children to demonstrate newfound digital skills. On one such occasion, Madilyn, the least expert of the children at the onset of the study, demonstrated how to access the *Dora's Dress Up Adventure* (Nickelodeon, 2012) application on the iPod for her Papa Henry (Figure 4.46). She tapped the screen in order to select the game and proceeded to show him how to dress Dora and place her in different backgrounds. Never looking up from the device, she said, "This is how you do it, Papa."

Figure 4.46. Madilyn demonstrated her new digital skills to her grandfather.

On another occasion Aiden taught me how to play the *Angry Birds* (Rovio Entertainment, 2012) application. Prior to his teaching, I had watched him play the game repeatedly, but had never tried to play it myself. This game required visual and tactile acuity in which the control of birds on the screen and the appropriate trajectory of the bird's flight determined how successful the player was at knocking down towers at different levels. Aiden appeared proud as he told me what levels he had mastered and asked me if I wanted to learn how to play the game. I agreed, and he systematically

explained the directions: “First, you put your finger right here.” Then he demonstrated by putting his finger in the spot where he wanted me to place my finger. He drew back on the virtual slingshot that held the bird and let go of it so that it flew across the screen and knocked down the tower. He then asked me to put my finger on a specific spot on the iPad. He held my hand as he showed me how to draw back on the slingshot and angle the bird so that it would fly into the towers and knock them down. He asked me to repeat this several times with his help before handing the iPad to me to try on my own.

As demonstrated in the story above, as an expert in digital environments, Aiden was learning how to mediate learning for others. I noted his perfectly timed use of modeling, demonstration, and guided practice as he taught me how to play the game. No one had ever taught Aiden how to teach a skill through the gradual release model, but he demonstrated it perfectly as he guided my finger to that just right spot on the screen, held my hand to pull the slingshot back, let go of my hand, and said, “Now let go.” My first attempt was not successful; the bird did not make it to the tower. Aiden reassured me that it was alright and told me to try it again and that it had taken him a long time to get better at it as well.

Other Children/Peers as Experts

While the children were often in the role of digital expert, they were also quite willing to surrender control of digital devices when there was an opportunity to learn how to do something new from another child. For example, on one occasion Madilyn was learning how to play a new matching game. Aiden leaned over to model how to open the application and provided a short demonstration of what to do next (Figure 4.47).

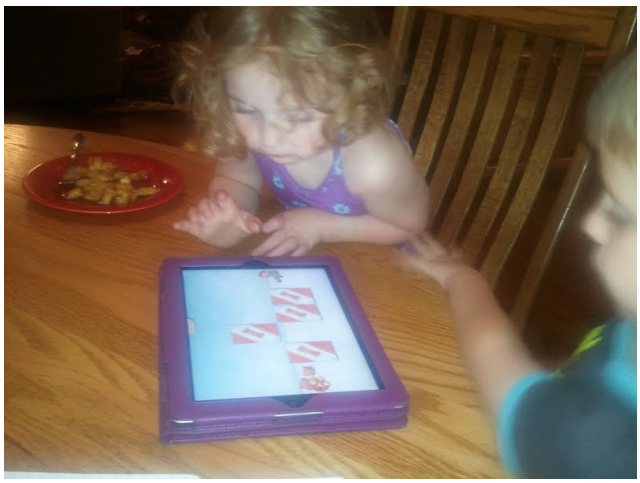

Figure 4.47. Madilyn acted as apprentice while Aiden acted as the expert to help her with an application on the iPad.

After Aiden provided support to help Madilyn play the application, he sat up straight beside her, moved his hand away from the iPad, and allowed her to try what he had shown her. He watched as she repeated the movements that he had demonstrated. Not only was Aiden an adept teacher/expert but Madilyn was happy to accept him in that role and benefit from it.

This also occurred when the children sought advice from children outside the family. On two separate occasions, Aiden and Makayla interacted with several other children while at the public library. On one occasion, I took Aiden with me to the library when I met with one of my students, eight-year-old Noah, for summer tutoring. During the time that I worked with Noah, Aiden sat on the couch in the library and played with the iPad. When the tutoring session was over, I introduced the boys and they immediately struck up a conversation about *Angry Birds* (Rovio Entertainment, 2012). Noah told Aiden that he had beaten all the levels on his iPod. This seemed to elicit immediate respect on Aiden's part, placing Noah in the role of expert when he responded by saying, "Wow, all the levels?" After they discussed what levels they had mastered,

they then took turns as they each played the game and tried to advance to the next level on my iPad (Figure 4.48).

Figure 4.48. Aiden as he learned from Noah in the library

On another occasion when Makayla and I were at the public library, another student from my school was reading a book in the children's section. Tommy asked if I had my iPad with me. He was aware that I often carried it with me because he had used it when I worked with him on reading skills at school. I told him that I did and handed it to him. He selected the application, *Teach Me 2nd Grade* (24 X 7 Digital LLC, 2012). Makayla appeared intrigued by Tommy as he used my iPad. She joined him at the table and watched as he selected answers to the questions within the application (Figure 4.49). She did not try to take the iPad from him, but occasionally tried to help him select answers. While they were both usually shy about engaging with children they did not know, the presence of the digital tool seemed to help them break the ice as Tommy showed Makayla how to play an application on the device with which he was familiar.

Figure 4.49. Makayla in the apprentice role with an expert at the public library

Another example of the children learning from peer experts also occurred at the public library. I had tried several times, unsuccessfully, to engage Makayla in print book reading. She refused to allow me to read to her and did not appear interested in looking at the books that I selected for her. When I offered to read one of the books that she had self-selected from the rack of paperback books, she responded by saying, "No, read. No!" I placed her books on one of the small tables in the children's section and sat down in the rocker not far from her. She walked up and down the aisles that held the board books, stopping occasionally to look at the cover of a book. It was not until she saw a child engaged in reading near the table where I had placed her books that she knelt down on her knees and picked up a book. Makayla held the book up almost at the exact angle that the young girl held her book and then peered over the top of it to observe what the girl was doing. As the girl turned the pages and pointed at the text, Makayla did the same thing (Figure 4.50). She occasionally stopped to look at the child and then continued to look back at her book. This child, a complete stranger to Makayla, served in the role of

expert. Makayla, as an apprentice to this young girl, had learned reading behaviors from her.

Figure 4.50. Makayla reading a book after she observed a peer reading at another table

Digital Tools as Experts

While the children often served as digital experts with each other and the adults in their worlds, they also learned from the devices. This was particularly true of the applications and eBooks that were available on the iPad, iPod, and Nook. The applications allowed the children to enter into play because they were mediated by speech or visual directions within the application. The children did not have to depend on a human expert such as a parent, another child, or me, to allow them to enter into virtual play. The press of a button activated virtual experts within most of the applications. At times, the voices would ask questions and the children answered the questions aloud as if the interaction was with a real human being. Some applications even recorded the children's voices or led them to other layers of engagements within the device. The children became dependent on these digital experts to access and play the applications they selected. Virtual mediators provided directions for entering the play, redirection

when the children took the wrong action, and provided corrective or encouraging feedback along the way.

As mentioned in a previous finding, the presence of the virtual experts was repeatedly demonstrated by the children's need for sound when using the applications on digital devices. An example comes from an occasion when Aiden was using the iPad in church. I turned off the sound so he would not disturb others. Aiden asked several times if he could turn up the sound, and I repeatedly told him he would have to play it with the sound off. This seemed to frustrate him because he obviously needed the direction of the voices to know what moves to make. I provided him with a small set of earphones while he was in church so that he could hear the mediator within his applications and successfully engage in digital play.

On another occasion, Madilyn was playing an application in the car. The music that accompanied the application was loud and her grandfather asked me to turn off the sound. When I did, Madilyn protested, saying, "Nana, I need to hear Dora." Dora had been giving her directives, and without the sound, she could not continue the virtual play in which she was engaged.

In the same way, music in the digital applications served to mediate the children's transactions as well as their learning. As the children made progress within a particular application, the music often remained upbeat. When the children were not successful with an application, the music often changed to minor or dissonant chord. This was demonstrated on one occasion as Aiden played the *Jake Neverland Pirate School* (Disney, 2012) application. The initial screen provided a repeated refrain of a pirate ditty until Aiden selected the play button. As soon as the play button was selected, a child's

voice provided directions for how to navigate the application and was then followed by music that accompanied the verbal directions. The intensity of the music and the use of major and minor chords served to mediate Aiden's play.

Even Makayla, who was only two years old at the time of the study, came to depend on digital experts to guide her transactions with applications she selected. This was demonstrated on one occasion when she became very agitated when the sound was turned off of the device while she played with the iPad in a restaurant. She had selected *Dora's Dress Up Adventure* (Nickelodeon, 2012). I elected to turn the sound back on to calm her down and observed her as she engaged with this application. As she selected items to add to her virtual picture, sound effects *popped* and *clicked* as items were successfully selected and placed in the picture. The sound effects were the experts who let her know when to release her finger from an item she had selected to add to her picture.

The Children Exhibited a Greater Sense of Agency, Empowerment, and Confidence with Digital Materials Than They Did with Print Materials

Much like the research by Gee (2011), in which he posited that video games allow children to *power up* their literacy skills, the children in my study seem to have been granted *super powers* as they worked to master digital tools. They explored applications that let them enter into play without the constraints of decoding text or getting permission from adults to enter into play within these environments. Through the analysis of data, I learned about differences between the children's sense of agency and confidence with print and digital materials. They (a) seemed less empowered and confident when engaging with print-based material, and (b) displayed more confidence and empowerment during digital engagements.

Confidence, Agency, and Empowerment with Print-based Materials

The children's words and actions demonstrated that they did not generally feel a sense of confidence when it came to print-based materials, particularly in comparison to the confidence they felt with digital interactions. They did not believe that they could read print-based materials in spite of the meaning making they exhibited while engaging with them. For example, I often invited the children to join me for a read aloud by asking them to come and read with me. This was usually met with "I can't read, Nana."

Another example comes from an occasion when Madilyn had been writing in a notepad for some time. She had made many marks, some of which were beginning to look like letters. She came to me with the note she had written and asked me to read it to her. I asked her to read it to me. She laughed and responded, "Nana, I don't know how to read." I found this interesting because she had written the note, and she believed herself to be writing something that I could read. Her actions seemed to convey that she believed that her marks were encoded with a message that only I could unlock.

While it was understandable that Makayla and Madilyn might not believe they were readers because of their young age, I was most surprised that Aiden also held this view of himself. In spite of his advanced performance on formative assessments, he did not consider himself a reader. However, when presented with a book to read, Aiden's entire demeanor changed. His head and shoulders dropped as if he were defeated before he ever looked at the first page.

I tried repeatedly to get him excited about books. On one of our many trips to the public library, I resorted to selecting a book which contained familiar television characters to try to engage him. Aiden seemed excited as I showed him the cover of a

book which had a familiar and favorite character, Scooby-Do. As I opened the book, Aiden said, "I still don't know how to read." This was a rebus book so I urged him to try to read it, showing him how he could use the pictures to help him read the story. He proceeded to do so. Accessing the print through the use of rebus images allowed Aiden to read the book with about 75% accuracy, but more important, he attempted to read the book. In spite of these kinds of successes, throughout the remainder of study, Aiden lacked confidence as a reader of print material.

The interview I conducted with Aiden's teacher shed some light on Aiden's view of himself as a reader. She told me that Aiden had progressed well as a reader, but that he was a perfectionist. She went on to say that, "Aiden thinks you have to know every word in a book to be able to read it. When he comes to something that he doesn't know, he gets frustrated quickly." She felt that he needed to learn to take risks and accept that he might not always get things right the first time. She saw Aiden as quite capable and identified his strengths as his ability to problem solve and his extensive background knowledge.

This lack of confidence in spite of the children's obvious competence with print materials was bothersome to me because I viewed their reading behaviors as early reading and wanted them to see themselves in the same way. However, they seemed to see reading as something that adults did for them.

Although the children generally exhibited a lack of confidence in their abilities as readers, there were some instances when they did utilize agency when interacting with print materials. At my house, the children often only engaged with print materials as a kind of time filler while they waited for my iPad to charge or while they waited for their turn as their sibling or cousin used the device. During those times, Makayla repeatedly

displayed agency in her decision to engage (or not engage) with books. On one occasion, I asked her to join me in reading the print version of the book *Dora's Musical Rescue* (Miller, 2011). This book had a side bar made of plastic with round buttons with pictures of the characters from the Dora story and played sounds when selected. I pressed several of the buttons hoping the sound would entice Makayla to join me for a read aloud. She threw her body down on the footstool and said, "No!" Then she came over to where I sat and pressed one of the buttons in the book, but she refused to allow me to read to her. Later, in an agentive move, she took the book from the footstool where I had placed it and turned the pages and said, "Dora." Moves like this were repeatedly demonstrated by Makayla as she made decisions about her participation in print-based read alouds by independently choosing books through which to engage.

Madilyn also displayed agency when she made choices she about print materials when selecting books in the public library. This was exemplified on one occasion when Madilyn self-selected a board book about baseball (Figure 4.51). She sat down at the table and readied herself to read the book. She looked at the cover and I heard her say, "I don't even like baseball; I don't have to read this book. She got up and returned the book the shelf from which she had gotten it and selected another book. Madilyn's actions indicated that she was aware that she had choices with print-based materials, and her decision to abandon this book demonstrated that she enacted some agency with print-based materials.

Figure 4.51. Madilyn as she prepared to read a book she then chose to abandon

Confidence, Empowerment, and Agency in Digital Environments

The children's confidence during digital engagements was demonstrated repeatedly in the way that they took charge of the digital devices by taking them into their own hands to play an application or engage with an electronic book. It was as if they were confidently proclaiming that they did not need an adult to engage with these tools. I was reminded of a phrase that Makayla used when she was confident about something she planned to try to do on her own, "I've got this." Having the opportunity to act as expert seemed to make the children feel confident and empowered. The children demonstrated this repeatedly in their actions and body language as they engaged in digital materials.

Digital confidence and empowerment. One example of digital confidence comes from an occasion when Aiden shared a newfound ability using digital materials. Aiden attempted to teach his grandfather how to add a name and photograph (an avatar) to an application he had mastered just moments before. Aiden sat on the couch beside his

grandfather and demonstrated how to go about adding photographs to *Write My Name* (NCSOFT, 2012). His body language and words conveyed confidence as he demonstrated the steps in the process for his grandfather. He sat up straight holding the iPad so that his grandfather could see the screen and said, "Look, Papa, this is easy" as he selected the screen that allowed him to access the camera roll on the iPad. Aiden's grandfather watched him intently as he went through the steps to complete the task. Aiden said, "First you need to find the picture you want to use. Then you just tap on it like this." Aiden demonstrated how to select the picture. When Aiden tried to hand the iPad to his grandfather to allow him to try it himself Henry said, "You did such a good job, you just do it. I might mess it up." Aiden went on to add the photographs and names of several family members (Figure 4.52).

Figure 4.52. Aiden as he demonstrated how to upload photographs into the application *Write My Name* (NCSOFT, 2012)

Another example of digital confidence was when Madilyn showed Makayla and Aiden how she had learned to access an eBook on the literacy computer at the public library. As seen in Figure 4.53, Aiden and Makayla looked on from beside and behind her as Madilyn accessed *Stellaluna* (Cannon, 1993) for the three of them to view. Aiden stood behind her and watched her as she accessed this book but did not interfere or offer

her assistance. Aiden's head remained cocked to the side as if he questioned her ability to complete the series of moves needed to activate the program, and Makayla listened attentively as Madilyn described what she was doing as if she were studying her actions for future reference. I interpreted Madilyn's control of this engagement as empowering. Madilyn had been the least adept at digital skills at the beginning of the study. She quickly mastered controlling the mouse to launch the application of different games and electronic books within the literacy computer. In this instance, her brother, Aiden, and cousin, Makayla, empowered her by looking on as she demonstrated newly developed skills (Figure 4.53).

Figure 4.53. Madilyn acted as the expert on the library computer.

Similarly, Aiden was empowered as he mentored me into learning how to play an application on the iPad. Over the course of the study, Aiden learned a great deal about helping others learn. He demonstrated a sense of agency on many occasions as he took on the role of expert, but this was best exemplified one evening when he had been playing a new racing application and spent most of the evening totally engrossed in trying to master the first level of this application. I watched as he used his entire body to lean into turns

and zoom forward through obstacles. I asked if he would show me how to play. It took Aiden several minutes to respond to my request because he could not pull himself from the application until he reached the end of the race course. At that point, he looked up at me and, clearly empowered as an expert, said, "Sure, I can show you how to play it." Holding the iPad in his own hand, he turned the screen around and demonstrated how to select a truck and a track for engaging in the applications. He also demonstrated how to use the skills he had acquired to control the movement of the truck, such as leaning the iPad forward to move the truck forward and tilting the iPad to the left and right to control the direction of the truck's movement. His tone of voice and body language demonstrated the sense of empowerment he was experiencing. As he described the way I should play the application, his voice deepened and his posture became more upright.

After a brief tutorial in the logistics of this application, Aiden handed the iPad over to me. Metaphorically, I had been handed the steering wheel and it was my turn to try out what had just been modeled. He sat beside me and watched my every move as I manipulated the truck forward along the desert track that I had selected. I repeatedly ran off the road and at times made the truck spin around and around as I tried to maneuver along the course. After a few minutes, I was hopelessly lost in the virtual desert. I expressed my frustration, and Aiden took the iPad from me and said, "Here, Nana, I will get you out of trouble." It only took him a few seconds to restore my truck to the intended course and when he was satisfied he had me out of trouble, he handed the iPad back to me and said, empowered by his expertise said, "Here you go; don't do that again."

Digital skills, empowerment, and agency. Like Aiden, throughout the study, all of the children repeatedly displayed digital skills that seemed to empower them. For

example, as Madilyn began to learn how to minimize and maximize images on the iPad, she demonstrated how the mastery of these digital skills empowered her. On one occasion, she was on the iPad and had accessed the eBook *Meet Biscuit* (Capucilli, 2012). As she attempted to move the characters around on the screen, Aiden reached over and demonstrated how she could make the dog larger by opening and closing his fingers. This brief demonstration led her to mastery of that skill. She opened and closed her pointer and thumb to minimize and maximize the image on the screen. As she became more adept at this skill, she began to use her skills within other applications (Figure 4.54).

As Madilyn continued to learn digital skills, she used them in new ways within other applications. These skills gave her the ability to enter into digital play without the assistance of adults or her brother, Aiden. Karen's awareness of Madilyn's increased digital skills and sense of agency was exemplified when she said, "I remember that little Alien game and I would have to help her get that little alien over there for her. Now she can move it as well as I do and she can do that in other apps."

Figure 4.54. Madilyn used her new touch screen skills on other applications.

Virtual identity and empowerment. It seems clear that, even at the children's young ages, virtual identities were beginning to develop. Aiden began to build his virtual identity through the use of avatars (a picture or symbol representing a person, in this case photographs of Aiden uploaded into applications or images of digital figures) with his own digital content. These avatars allowed him to resume play when a game was interrupted and keep up with his progress within certain programs. For example, avatars allowed him to enter into an imaginary world in which he was *Pirate Aiden*. As part of the setup for initial play in the application, *Create a Car* (ABCya.com, 2012), Aiden was prompted to create an avatar to represent his identity. This was a child friendly process and Aiden was able to complete it independently. The only help I offered was to tell him where to type his name. Before he typed his name, Aiden selected the image of a pirate to represent his identity. Rather than typing just his name, Aiden asked me how to spell *pirate* and entered his desired screen name, *Pirate Aiden* (Figure 4.55).

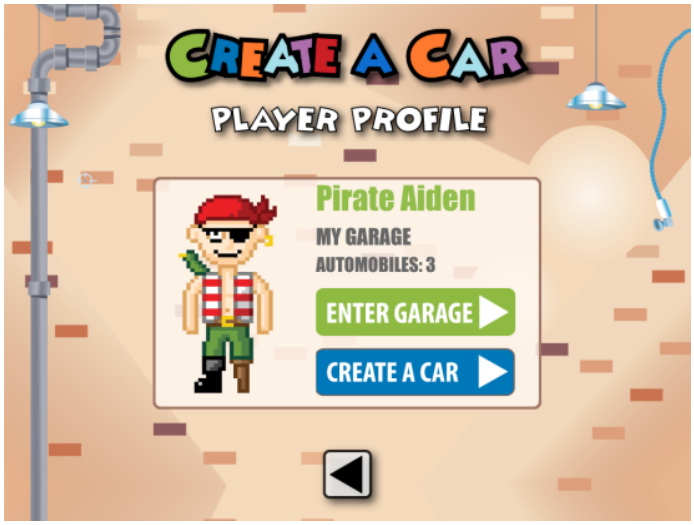

Figure 4.55. Aiden's virtual identity as displayed in his player profile in *Create a Car*

Madilyn also asked for her own virtual identity. While this was somewhat of an anomaly in the data because Madilyn only asked this one time, I could not overlook her

words when she looked up at her grandfather with the iPod in hand and said, “Papa Henry, where is me?” He had no idea what she was asking and it took me a while to determine that Madilyn was asking her grandfather where her avatar was. Actually, it took Aiden’s help for us to figure this out. Madilyn knew that Aiden had applications with his picture, or avatar, on the home screens that allowed him to access his name within the applications. She wanted to have her own avatar, a virtual identity. Aiden suggested that we should download an application “for little kids” like the one that helped him learn kindergarten skills, *Teach Me Kindergarten* (24X7 digital LLC, 2012). I found an application in which Madilyn could have an avatar of herself - *Teach me Toddler* (24X7digital LLC, 2012). Aiden helped me upload a picture of Madilyn, and suggested that we add Makayla’s photo and his own as well (Figure 4.56).

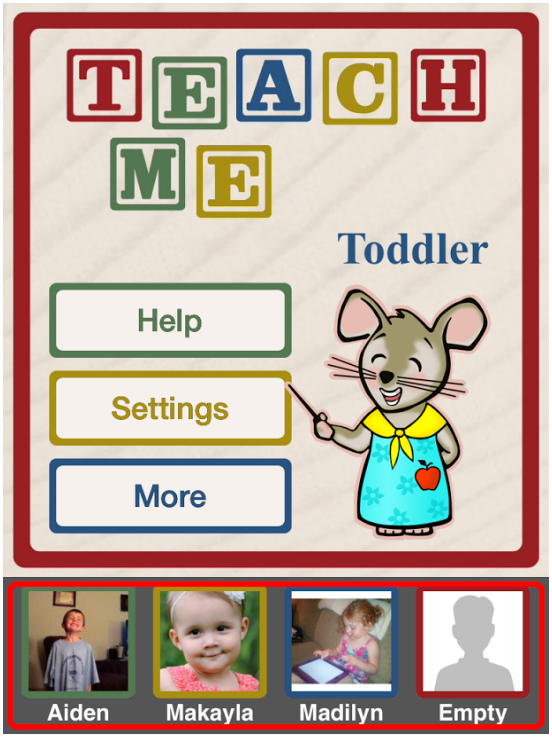

Figure 4.56. The application that gave Madilyn an avatar

Agency and empowerment through ease of access. Digital tools seemed to provide the children with a sense of agency because of the ease of independent access. While the children had easy access to print materials, engagement with those materials was often dependent on the willingness of others to read to them. While the mothers indicated that, at times, the children looked through books and magazines independently, this occurred less frequently than did the children's independent use of digital materials. The children could activate digital engagements with the touch of a finger. For example, Makayla could access the *read to me* feature of *Llama, Llama Red Pajamas* (Penguin Group, 2011) with the swipe of her hand and the press of a button. She did not have to wait for an adult to engage her. She had agency and was digitally empowered because she had access to the book and could engage successfully with it on her own.

Digital icons and agency. As the study progressed, I acquired a large number of applications on my iPad that were intended for the children's use. I had so many applications that it required the children to swipe through several pages of applications to find their desired content. They became very adept at this, but as I downloaded more and more apps, it became more difficult for them to find their own applications. Consequently, I decided to organize my digital content into folders (Figure 4.57).

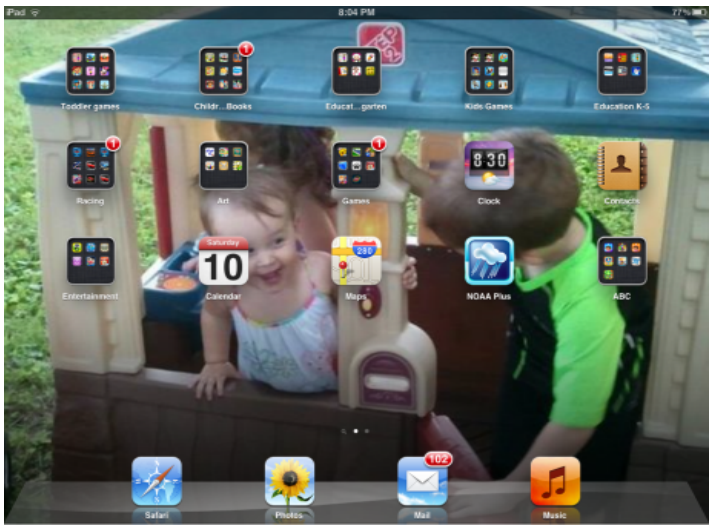

Figure 4.57. The iPad applications after I organized them into folders

While I was worried that putting the applications in folders might conceal the content for the children, I quickly found that providing folders with icons to identify them helped to support their access. The role of digital icons in the children's ability to be agentic was demonstrated the first time I showed Makayla how to access the folder that I had created of her toddler applications. After I demonstrated how to access the content in the folder by tapping on it, she was able to find her content without my assistance. Madilyn was also able to access her own content through the use of these folders. This was repeatedly demonstrated in the data, but is best illustrated in an occasion in which Makayla scrolled back and forth between home screens, scanned each icon, and then swiped the home screen again as she looked for an application she wanted to play. She scrolled for several minutes before she located the application she wanted, *Bug Games* (Busy Bee Studios, 2012). When she returned to the iPad later that day, she remembered the location of the icon which represented *Bug Games* (Busy Bee Studios, 2012) and quickly accessed it.

Aiden was not only able to access the content through the use of the icons on the folders, he exhibited agency as he helped me reorganize his applications. This occurred after I shared with him how I had organized all of the applications that I had on my iPad. Aiden quickly became quite interested in the idea of organizing his own applications, and he immediately provided suggestions for the ways I might do it. After I showed him the applications that I had put in the folder for him entitled *Kid's Games*, he immediately wanted to refine the organization by creating a folder called *Racing Games* and *Art Apps* (Figure 4.58).

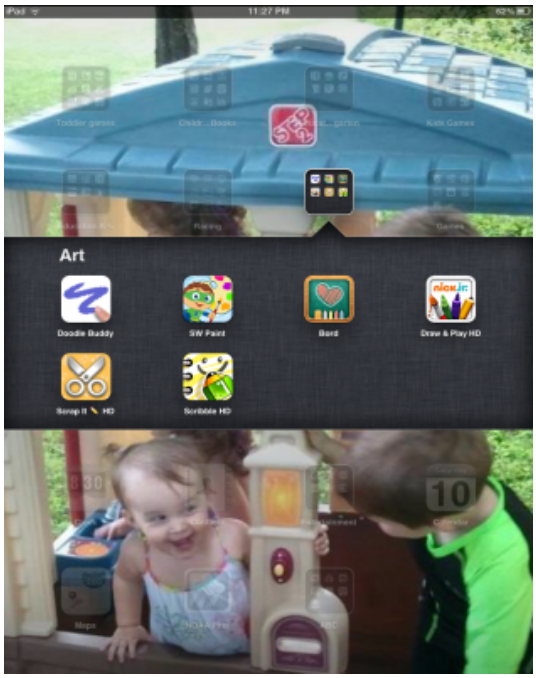

Figure 4.58. Aiden's folder that he named *Art Apps*

Aiden was so empowered by the ability to organize applications that he even offered to organize the applications on his parents' iPad. They declined the offer, but I felt that when Aiden offered to do this, he demonstrated agency and confidence in his ability to do so.

Self-selection of digital content as agency and empowerment. Although opportunities for access to digital materials were largely controlled by children's parents, the children became increasingly adept at self-selecting and negotiating access to personal favorites. All three children had applications that they self-selected and to which they returned repeatedly. Madilyn regularly accessed *Dora's Dress Up Adventures* (Nickelodeon, 2012) which allowed her to create different scenes with Dora and dress her in various hats and clothing. This application also allowed Madilyn to take a photograph of her final picture and save it in a virtual picture album. This virtual paper doll application was one of Makayla's favorites. Jenny termed these favorite apps as Makayla's *go to apps*. This changed over time, but *Bug Games* (Busy Bee Studios, 2012) remained a favorite because she seemed to enjoy being able to control the singing crickets by repeatedly selecting different songs. The children's self-selection of favorite applications demonstrated their control over their own play, thus empowering them.

Makayla also demonstrated agency in digital materials as she selected digital content on the iPad. She was the youngest of the three children, but in many ways the most determined to demonstrate a sense of agency with digital materials. This was demonstrated when she was the first of the three children to lay claim to the iPad. As shared in the opening scenario, as I used the iPad one evening, Makayla took the device from me and said, "My Pad." At the time I thought how clever it was of her to substitute one pronoun for another as she claimed ownership and thus control of this device at that time. She immediately went to the folder that contained her application and self-selected her *go to app* for that particular point in time, *Bug Games* (Busy Bee Studios, 2012). Once she was in the application, she tapped the screen to activate the home screen and

selected the music icon that allowed her to hear a rendition of "The Farmer in the Dell" sung by three crickets, repeatedly.

In these ways, Makayla, at age two, demonstrated agency as she self-selected and accessed digital tools without assistance from adults. The only time she appealed to me for help was when advertisements for other apps popped up and halted her play. When this happened, she did not relinquish control of the device, but rather, she held on to it while the obstacle was removed by the adult (or at times, by Aiden) so that she could return to her digital play.

The Children Learned a Range of Skills and Strategies as They Engaged With Both Digital and Print Materials

As I analyzed data, it became apparent that significant learning was taking place as the children made meaning with both print and digital materials. Through experimentation, exploration, demonstration, and direct teaching from experts, the children learned and demonstrated expertise regarding: (a) learning about reading, (b) learning about writing, (c) learning digital skills, and (d) developing awareness of print and digital tools as forms of communication**.**

Learning about Reading

Throughout the study, the children learned and demonstrated understandings about reading as they engaged with both print and digital materials. The children engaged in the reading acts they saw other members of their culture engage in; therefore, their early reading behaviors often took the form of *approximations*. Observing the children engaged with print materials was an important form of assessment allowing me to understand more about their knowledge and skill as readers. In the process, I understood

more about the children engaging in *reading-like* behavior long before they were able to fully participate as fully literate users of print tools.

Makayla and Madilyn. Examples of Makayla and Madilyn demonstrating their abilities as readers occurred regularly throughout the study. Often, it was easy to tie their behaviors to adult demonstrations and the children's approximation of those behaviors. For example, Makayla often looked through her mother's recipe books while Jenny was preparing meals for her family (Figure 4.59). Jenny had a collection of recipe books gathered over the years and often used them in Makayla's presence as she prepared food for her family. One occasion that is representative of these events occurred one evening when Jenny had been searching through several recipe books to find a specific recipe that she planned to prepare. Makayla joined her mother at the table and began to browse through the books as well. Looking through the recipe books provided Makayla with the opportunity to approximate reading and to practice book handling skills. She engaged in reading-like behaviors (demonstrating her knowledge about concepts about print) as she turned the pages, looked left to right, and looked at print based sources to make meaning.

Figure 4.59. Makayla approximating the use of print-based materials

Through their observations of others, the children also learned electronic book handling skills. As they engaged with eBooks, they learned how to select particular books by tapping on the icon (depicting the book cover,) select the *read to me* option, advance the pages by swiping from right to left (or by scrolling down), and access the other layers of engagements from the main menu. As they learned these concepts of digital books, they developed certain expectations of these books.

An example of this occurred one day when Madilyn selected *Dora Loves Boots* (Nickelodeon, 2011) on my Nook. It quickly became apparent that Madilyn had come to expect certain options within digital books such as the *read to me* feature. Madilyn selected this book from the main menu of my Nook by tapping on the icon (a picture of the book cover). When the book opened, she tapped on the screen and swiped her finger the right to the left to advance the book to the title page (Figure 4.60).

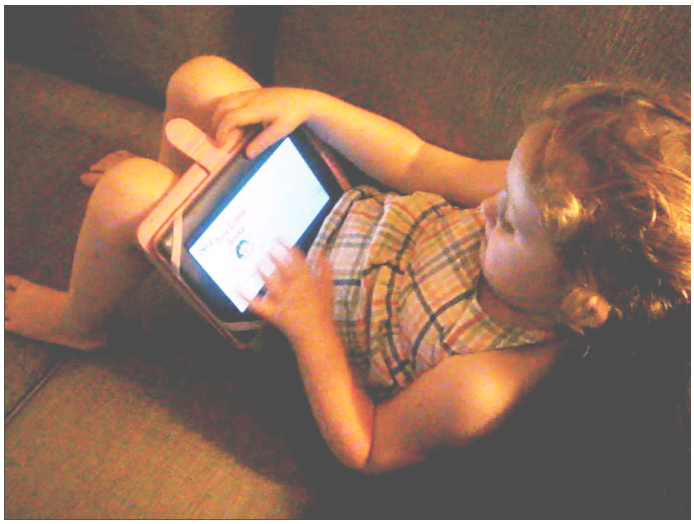

Figure 4.60. Madilyn as she applied her knowledge of electronic books to an eBook on my Nook

The book was displayed in a two-page spread just as it would be viewed in the print-based version of the book. Expecting the *read to me* feature that she knew from

other eBooks, Madilyn swiped through several pages and tapped the screen over and over as if she were trying to activate the voices that would read this book to her. She appealed to me and said, "Help me, Nana, it won't read" as she continued to tap furiously on the screen. I explained to her that this was a book that I would have to read to her. She looked at the screen for a moment and then selected the button that took her back to the main screen so that she could select a different book that did contain the *read to me* feature.

Another example of how the children learned reading skills was the way that Madilyn and Makayla learned letter identification through transactions with the *Dora's Skywriting ABCs* (Nickelodeon, 2012) application. On one occasion, Madilyn selected the application and selected the "Letter and Picture Match" option in the application. The first letter that appeared was the letter *A*. She was asked to find the picture that had the some beginning sound and drag it to the cloud. She experimented with this by pulling various pictures to the cloud. When she selected the wrong picture (as when she selected the picture of the queen) the application responded by saying, "That's not it, try again." Through this engagement, she was learning about initial consonant sounds.

As I considered the many ways that Madilyn and Makayla learned about reading through digital materials, I recognized that the engagements provided many opportunities for the girls to development phonemic awareness, expand their vocabularies, and experience demonstrations of fluent reading. They also had many opportunities to develop story sense as they listened to and engaged with electronic books and story-telling applications.

Aiden. Having had many reading experiences with his family prior to this study and through his experiences having attended Four-Year-Old Kindergarten the year prior to this study, Aiden had developed many reading behaviors. He began the study with many well-established concepts of print, but he continued to refine and add additional concepts about both print and digital materials throughout the study. Additionally, Aiden developed a variety of other reading behaviors that demonstrated his growing repertoire of reading skills within both print and digital materials.

Since Aiden had completed Four-Year-Old Kindergarten by the time the study began, I administered *The Show Me Book* (DeFord, 2002) to understand more about his reading knowledge. This assessment was designed to determine what concepts young children have mastered as they grew into deeper understandings of print-based materials. Early in the study, Aiden demonstrated mastery of all seventeen measures of early concepts of print which included elements such as left to right directionality, return sweep, and distinguishing between letters and words. Following this assessment Aiden demonstrated mastery of basic sight words both in isolation and in connected text. He was clearly developing an understanding of the ways that written sign systems work; however, he did not see himself as a reader. He often told me, "I can't read yet." His use of the qualifier "yet" indicated that he viewed this ability as something that would happen in the future.

In spite of Aiden's negative view of himself as a reader, he demonstrated his growing ability to read on numerous occasions. Aiden's ability to read was most apparent as I observed him reading environmental print in home and community settings. For example, on one occasion, Aiden looked at a plaque I had hanging in my kitchen. He read

the words on the plaque aloud (Figure 4.61). He then pointed out to me that those were some of his *popcorn words* (in Aiden's classroom, high-frequency words that children were expected to recognize by sight were termed *popcorn words* because they pop up in texts regularly). As Aiden read these popcorn words, I pointed out to him that he was reading.

Aiden also demonstrated his growing ability to read while he used digital materials. An example of this occurred one day when he accessed his racing games on the iPad. Reading the icons to access these games allowed him to select the digital content he wanted, but many of these applications had a great deal of printed instructions directing viewers about selecting desired tracks and cars. Aiden repeatedly demonstrated his ability to read words within these applications. When I asked Aiden how he learned how to play the racing game, he just shrugged his shoulders and said, "I don't know, I just push the buttons and then I pushed that button." Actually, Aiden had done more than push a button, he had read the words *play, race, practice*, *select,* and *lap* in order to engage in this game. He showed me the buttons that he pushed. He had identified the words he read as buttons.

Figure 4.61. An example of environmental print that Aiden read

Learning About Writing

Throughout the study, the children also learned writing behaviors through the use of both digital and print materials. When writing in print media, the children used a variety of materials such as crayons, markers, chalk, pencils, and pens as they wrote on notepads, sticky notes, paper, easels, or the sidewalk. The children experimented with writing digitally as they tapped on the keyboard to make letters appear on the screen of their parents' laptops or, in Aiden's case, keying his name into applications and searching for applications using known words on the iPad.

Madilyn and Makayla. The children often wrote in print-based formats when they wrote on notepads and then provided me with their interpretation of what it said (Figure 4.62). This demonstrated that they believed that the marks they were making were indeed encoded with the messages that they recounted. For example, Makayla was often seen experimenting as writer with both hands as she multi-tasked to eat ice cream while trying to write letters on her mother's notepad. Likewise, Madilyn often wrote in small notepads.

Figure 4.62. Madilyn and Makayla experimented with writing in different contexts.

Another example of the Makayla exhibited knowledge as a writer in print contexts was the way she wrote on her easel. She told her mother that she was doing her homework. She learned about homework when she saw the older children at her sitter's home doing homework after school. Debbie (the sitter) reported that Makayla would sit beside the older children and write on paper just as she saw them write. Makayla transferred this practice of doing written homework when she wrote on her own easel in her home (4.63).

Figure 4.63. Makayla as she wrote on her easel

Aiden. While Aiden could write many known words, he chose not to write during the data collection period. I found it unusual that, while Aiden could write some words, there were no examples in the data of Aiden writing in print-based formats except the formative assessments that I administered and the written conversation discussed earlier. Although Aiden's ability to write words was demonstrated when he wrote several known words as part of the *Show Me Book (*DeFord, 2000) assessment (Figure 4.64), he did not choose to write when he was in my home. That is not to say that he never wrote during that five-month period, but member checking confirmed that Aiden did not spend a lot of

time writing in his home setting. However, when I interviewed his teacher, she said that he quite willingly wrote at school. His teacher also shared that Aiden composed a story about his iPad and had won the writing award for his kindergarten class that nine weeks.

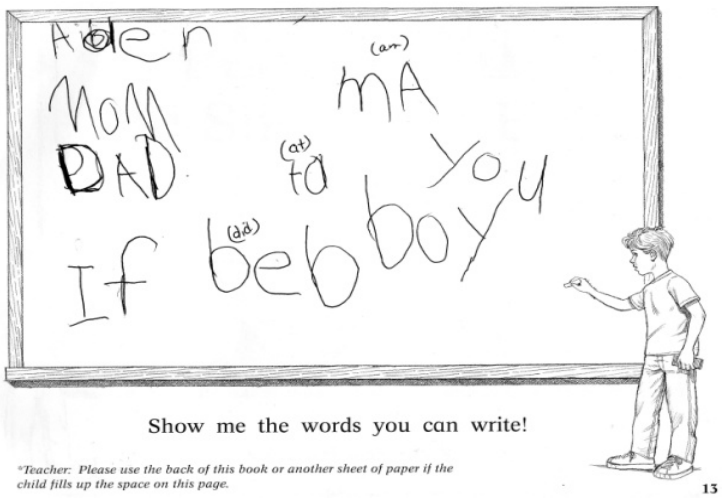

Figure 4.64. Aiden's known words from the *Show Me Book* assessment

In my presence, Aiden did draw and make signs which demonstrated that he understood that writing could be read by others and that written messages had the potential to bring about changes in a person's life. For example, at one point in the study, he decided to make a no smoking sign for his grandfather (Figure 4.65).

Figure 4.65. Aiden's no smoking sign

Aiden demonstrated his knowledge of digital writing behaviors more frequently than he demonstrated print writing. Many of the children's digital toys required them to key in letters to write in digital formats. This was exemplified as Aiden keyed his name into the application *Write my Name* (NCSOFT, 2012). He asked how to spell everyone's name and then keyed in the names of his family members after uploading their pictures. This demonstrated that Aiden understood that names are spelled a certain way and that they can be keyed into a digital device just like they can be written with a pencil or pen. Aiden also demonstrated digital writing knowledge when he emailed his artwork to his parents.

Aiden further demonstrated his ability as a writer on an occasion when he created a piece of artwork within the application *Nick Jr. Draw and Play* (Nickelodeon, 2012). In this piece, Aiden integrated his knowledge of basic sight words into his artwork (Figure 4.66). He began by using the splatter spray paint option within the application to create the multicolored background. He then layered the image with stamps of coins and shells to write the word *MOM* in the center of the piece.

Figure 4.66. A piece of artwork in which Aiden electronically wrote the word, MOM, created, saved, and sent to his parents via email

Learning Digital Skills

While the children's parents initially felt that little *real learning* occurred when the children transacted with digital tools, data repeatedly demonstrated that, in addition to learning about reading and writing, there was much further learning going on. The children learned about and through (Halliday, 1975) digital tools as they played with various applications. This was apparent with regard to mastery of the not only new content such as recognizing colors, numbers, letters, and about topics such as music, but also mastering digital skills such as creating, saving and sending; swiping, enlarging, and minimizing; and developing fine motor skills.

Creating, saving, sending. One digital skill that Aiden demonstrated regularly was creating digital documents or artwork and then saving them to the iPad and sending them via email to his parents. For example, the splatter paint artwork that Aiden created with the word, MOM (Figure 4.65) was one that he saved and sent. To do so, he selected the appropriate icon (an image of a floppy disk) and saved the image to the photo gallery. Then Aiden wanted to send his artwork to his mother, so I demonstrated how to send the piece of artwork through email. Following this demonstration, Aiden regularly asked to save and send his artwork.

Swiping, enlarging, minimizing. Similarly, Madilyn developed and demonstrated knowledge of digital skills. During the initial interview, Karen discussed the fact that she had not let Madilyn use the iPad or her iPhone very often because of Madilyn's young age, assuming that it would be too difficult for her. This might have been the case at the onset of the study, but it did not take Madilyn long to master swiping,

enlarging and minimizing, and self-selecting her own content within digital environments (Figure 4.67).

Figure 4.67. Madilyn accessing applications on the iPod

Motor skills. In addition to learning how to use digital tools, all three children demonstrated increased fine motor skills as they became more adept at using the touch screen on digital devices. Makayla was particularly adept at using all ten fingers as she accessed digital devices and played applications that she self-selected. I likened it to someone playing a piano. This increased aptitude in the skills required to engage with digital devices led to an increased interest in the iPad as she became better able to select applications and manipulate items on the screen to engage in digital play.

An example of this was one occasion in which Makayla selected *Bug Games* (Busy Bee Studios, 2012). The home screen of the application has four options for engagements. Makayla had explored this application on numerous occasions, and seemed to prefer the music option that provided four songs sung by singing crickets (Figure 4. 68).

Figure 4.68. The home screen and music screen from the application Bug Games (Busy Bee Studios, 2012)

On this occasion, from the home screen of the iPad, Makayla used her right index finger to select the folder that contained the application. She then used her left ring finger to select the application. The home screen appeared and she used her left ring finger to select the music option and then used her right ring finger to select the image of the cow to play the song "The Farmer in the Dell." The three crickets sang the song in its entirety unless the images were touched at which point the cricket, when touched, sang one word from the song. Makayla used her fingers on both hands (with great dexterity) to tap on the crickets to play the song.

About music. Makayla's agility in selecting content on touch screen devices demonstrated not only her fine motor skills, but that Makayla was learning about how to make music. Much like she strummed on Dalton's guitar, and tapped on the keys of my piano, she played the crickets in this application as she rhythmically tapped on them to cause them to sing the song. Makayla's engagements with the iPad were contributing to her growing knowledge of music and expanding her knowledge of multiple literacies.

Awareness of Digital and Print Tools as Forms of Communication

While all three children demonstrated a variety of skills sets in terms of print and digital materials, analysis of data pointed to their growing awareness of the ways in

which humans use language to communicate with each another. This awareness was demonstrated as they wrote on notepads, easels or made signs demonstrating awareness that these marks held meaning. The children also demonstrated a growing awareness of the ways digital tools were used to allow people to communicate across time and space.

This was best exemplified as Aiden discussed his mother's work life. At that time, Karen worked in a large city about fifty miles from their home. Aiden asked her one morning why she could not just Skype to do her work and stay home. Aiden had witnessed me Skyping with my dissertation committee chair and had asked what I was doing. I explained that I could do my work by connecting with my professor via the Internet. Aiden picked up on this and extrapolated it as a solution for keeping his mother at home demonstrating his understanding that technology offers the ability to conduct work in a variety of places other than just the traditional work place.

Madilyn and Makayla demonstrated their growing awareness of how digital tools were used for communication as they used their toy cell phones. On one occasion, for example, they were spending the night with me and used their toy phones to pretend to call their mothers. At other times they looked at the phone and pushed the keys as if they were texting a message (Figure 4.69) clearly communicating their knowledge of digital potential for communication with others.

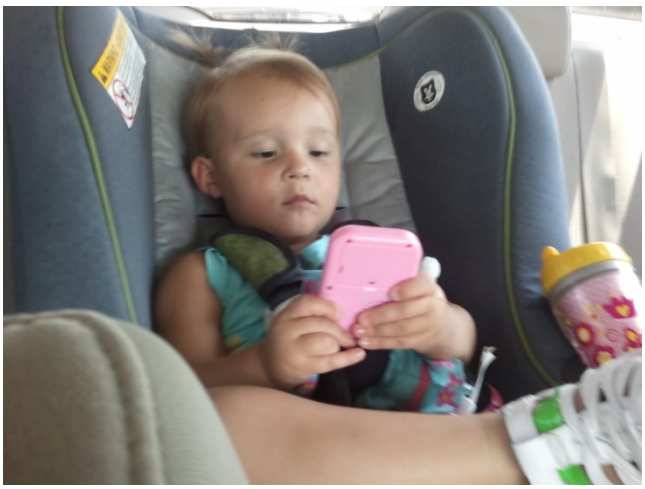

Figure 4.69. Makayla pretending to text on her toy cell phone

An anomaly in the data suggests that Madilyn understood that people communicate digitally when she recognized the presence of digital practices within a children's book. It is an anomaly because this kind of recognition was rarely demonstrated during print transactions. The children and I were at the public library and Madilyn selected the book, *Esme and the Tooth Fairy* (Graham, 2010). She browsed through the book and then ran over to me (book in hand) to show me that the fairies were "texting just like Mommy" (Figure 4.70).

Figure 4.70. A page that reflected texting as a means of communicating in the world, from a book Madilyn self-selected at the library

I found this incident important for several reasons. Not only had the authors chosen to include 21st century literacy practices within this narrative, but Madilyn made a personal connection to the ways in which her family communicated using digital tools and, in doing so, she recognized this form of communication as part of her own 21st century narrative.

A Final Reflection on the Children's Learning

As I tried to capture glimpses of the many literacy events that led the children to new learning throughout the study, I became aware of the enormity of this task. Much more was learned than I was able to capture in the discussion above. I could have organized this finding under the domains of learning and provided lists of observed skills and strategies the children learned, but I made a conscious decision not to do so. I felt that the data stories told throughout the earlier parts of the chapter also revealed what the children learned in the process. The most important learning that I took away from this finding was that more learning occurred than I ever imagined possible as the children engaged with both digital and print materials.

Conclusion to Chapter Four

As I looked into the ways that my three grandchildren used both print and digital materials over a five-month time period, I gleaned numerous insights about the ways that they accessed and used tools of their culture. As the children emulated the ways that print and digital materials were used by members of their webs of significance, they served in the roles of both apprentice and expert with adults, each other, other children, and texts. They appeared more empowered and agentive in their use of digital materials as opposed to their sense of agency and expertise with print materials, but learned many skills and

strategies and demonstrated expertise through engagements within both print and digital environments. The children experienced both intrinsic and extrinsic rewards when using all materials as they transmediated and transferred skills and information across digital and print sign systems. They learned about and through these materials as they developed content knowledge and learned concepts about print and digital engagement as well as reading and writing behaviors. And, as they observed demonstrations and emulated adults' use of materials, they learned that print and digital materials were used for a variety of purposes and ways to be in the world through transactions with those materials. Perhaps the most important finding was the realization that the print and digital materials that the children came to accept as a part of their worlds did not reflect worlds beyond their own providing little access to other racial, ethnic, or linguistic groups and introducing negative stereotypes regarding ethnicity and gender thereby reinforcing the dominance of whiteness and gender stereotypes.

As I explored ways that the children used print and digital materials, it became apparent to me that, as adults in the children's worlds, the children's parents and I held the keys to access to and engagements with these materials. In the following chapter, I will explore the ways we perceived and influenced the children's access to and engagements with print and digital materials, as well as the ways we learned more about the nature of literacy learning in the 21st century.

CHAPTER FIVE

THE GATEKEEPERS: ADULTS AND THE USE OF PRINT AND DIGITAL MATERIAL IN THE LIVES OF THE CHILDREN

During this study, I sought to learn about ways that my three grandchildren used print and digital materials in a highly technological world. In doing so, I learned a great deal about how the adults, including myself, impacted the children's access to and interactions with those materials. Families, caregivers, educators, and the media specialists in schools and public libraries regularly make decisions about materials for children. These decisions are surely made with the best of intentions. Materials are often carefully selected with hopes of providing children with educative experiences or, at times, as a means of protecting children from what the adults view to be objectionable content. In this sense, the adults in this study served as *gatekeepers* as they either provided or limited access to engagements with both print and digital materials. Through interviews, conversations, and observations, I gleaned findings which illuminated the roles that adults in this study played in three children's print and digital lives (Table 5.1). Consequently, while initially it was not my intent to learn about the adults in this study, data analysis led me to see their role as critical to the children's experience which led to the development of this chapter.

The parents faced many challenges as they juggled the demands of parenting and careers. I recognized that participation in this study added demands on the families involved and at times created tensions. However, without the adult participants, my

finding might be very different. The adults in the study, particularly the children's mothers, served as sounding boards for my ongoing reflections and often provided new perspectives that pushed my thinking and enriched the direction of my data collection. In addition, through interviews, conversations, and social networking, they provided deeper insights into the children's uses of print and digital materials.

Participation in the study also provided opportunities for the adults to think about and discuss the impact that their decisions about print and digital materials had on the children which, in turn, expanded their own understandings of literacy development. The learning that occurred throughout the study was not limited to the children and their parents. I also learned a great deal about literacy learning and recognized and confronted some of my own biases.

Table 5.1.

Findings about the Adults in the Study

The adults valued both print and digital materials and engagements, but held pro print-based biases.
Adults controlled the children's access to and content of print and digital materials.
The adults expanded their understandings about literacy learning through participation in the study.

The Adults Valued Both Print and Digital Materials and Engagements, but Held Pro-print Biases

Data repeatedly suggest that the adults in the study (including me) valued print and digital materials for their personal use and in the literacy development of the children. However, we held pro-print biases in terms of materials that supported *real learning* and had some reservations about providing the children with open access to

digital materials. As discussed in the previous chapter, adults provided the children with models of uses of print and digital materials. All of the adults involved in the study were regular users of print and digital materials within their day-to-day lives. They used print-based materials for a variety of purposes as they read for entertainment or information and wrote to record their thinking or communicate with others in their work and home life. Similarly, the adults were active consumers and producers of digital media. They used digital devices regularly as an integral part of their home and work lives and for a variety of purposes such as communication, productivity, entertainment, and gaining information. All of the adults owned smart phones, laptops, and iPads, and they each had access to the Internet. They also took part in online conversations through social networking and member forums.

Analysis of data led me to believe that the adults in the lives of these children found themselves caught in the flux between changes in communication practices and their own literacy histories. They valued the tools of technology which made them more productive individuals and saw a need to allow children to develop the skills and strategies to be able to use these tools in their day-to-day lives, but held nostalgic views of print-based materials and engagements. Consequently, while the use of technology was an integral part of the daily lives of all adults in the study, digital materials were, in many ways, seen as an *add on* or merely entertainment when it came to the children's learning. Jenny expressed this when she said, "it [technology] is just the cream on the top type thing, but it can't be the sole means for teaching children."

While the adults in the study used both print and digital materials seamlessly in their day-to-day lives, they held very distinct views about print and digital materials and

engagements with regard to their uses by the children. As I interviewed the adults, engaged in informal conversations, and observed them as they interacted with the children, I learned that the adults (a) viewed print-based engagements as preparation for school-style literacy, (b) recognized the importance of digital skills for success in school, but had reservations about their use, and (c) sought balance with print and digital materials, but expressed pro print-based biases.

The Adults Viewed Print-based Engagements as Preparation for School-style Literacy

Print materials held a position of importance for adults as the kinds of tools that provide experiences that would prepare the children for school-style literacy and lead them to become readers and writers. This was evidenced in pre- and post-interviews with the mothers, the children's sitter, and Aiden's teacher, as well as in comments made during conversations throughout the study. All adults who participated in this study viewed reading aloud from children's books as an important part of the children's literacy development and preparation for school.

This was also supported by the number of books that were made available to the children and the frequency in which the parents and sitter read aloud to them. Both mothers reported having over a hundred children's books in their homes and they reported reading aloud three to five times per week to their children. Jenny shared that that Makayla's nightly routine was to "take a bath, put her pajamas on, and she knows that we settle down to read." The sitter read to Makayla daily during the time Makayla was in her care, and once school began, Aiden's classroom teacher read aloud to the class daily.

Both mothers expressed that they believed important literacy skills were learned through the process of reading aloud to the children. Early in the study, the parents talked about reading aloud as if it were as important to the children's literacy development as a daily vitamin was to their nutrition. Karen expressed that she felt important skills were learned from reading aloud to her children. This was evidenced in her initial interview when she said, "When Aiden was younger he loved the book *Brown Bear, Brown Bear*...I really think that book helped him learn his colors." Karen felt that that experiencing the book had given Aiden knowledge that would be used later in school since knowing his colors was an important part of the curriculum in four-year-old kindergarten.

Jenny evidenced a similar view when she shared that Makayla had learned to identify the *O* and the *X* and developed book handling knowledge through their transactions with the picture book, *Chicka Chicka Boom Boom* (Martin & Archambault, 1989): "She knows when to turn the page because she knows the story." As a classroom teacher, Jenny recognized that these concepts of print were important foundations for school success. She expressed this when she said, "I have never seen her hold a book upside down. She knows how to handle books." Jenny further expressed that she felt that Makayla gained important book handling skills through participating in read alouds when she said:

> I have seen children get to second grade and not have book handling skills. Makayla will already have that. [Makayla] has had books in her hands for so long. It is like someone in athletics that has certain skills from practicing over and over.

She also shared that Makayla demonstrated a growing awareness of the feelings that book characters experience through their read aloud experiences: "She empathizes

with the characters and when he [baby Llama] throws a fit in the middle of the store she says, 'Oh, so sad, oh, Mama mad.' I mean she really interacts with the characters now."

In another example of parents viewing read alouds as preparation for school, Jenny talked at length about the books that Makayla loved to have read aloud to her. Jenny shared that Makayla could be *pulled into* books that had repeated lines or opportunities for her to chime in with Jenny as she read aloud. This was best exemplified in the video that Jenny posted on a social media site. In the video, Jenny was reading *Chicka Chicka Boom Boom* (Martin, 1989) to Makayla. It was bedtime and Makayla was a little fussy. Jenny sat on the couch with several books to her side and said, "Come on Makayla, let's read a book." Makayla began to fuss a little but came over to her mother and let Jenny pick her up and put her on the couch beside her. She pulled away from Jenny just as the book was opened. As soon as Jenny read, "A told B and B told C…" Makayla was visibly *pulled in* just as Jenny had described. Makayla leaned over to look at the book and her entire demeanor changed to one of marked interest. She settled in beside her mother and reached over Jenny's arm to touch the book with her pointer finger. Then she looked up at her mother and smiled as Jenny began reading.

Jenny talked about other reading behaviors that Makalya learned such as the way she engaged with predictable text. Jenny explained, "Makayla will go and get books that she knows really well, the ones that have all the repeated language, like *Where's Spot,* and will sit down and read them to herself because she knows all the words." Jenny felt strongly about the power of reading aloud. She described the experience of reading aloud to Makayla as *organic*, explaining that "the engagements that I have with Makayla while

reading aloud grow naturally out of the way I read the book and invite Makayla into the process."

The Adults Recognized the Need for Digital Skills, but Had Some Reservations About Their Use

The adults in the study recognized the need for the children to develop digital skills, but indicated that they had reservations about the excessive use of these materials. The parents seemed caught between awareness of the importance of children's adequate exposure to digital materials so that they could develop skills and learn from the content and worrying about too much screen time. Likewise they worried about the materials being socially isolating and interfering with other forms of play.

An example of this occurred when I asked about the importance of digital skills for success in school. Talking about the use of both digital and print texts, Karen said, "I don't see how it could hurt him [Aiden] . . . As I see Aiden starting to read, it is learning how books work, how words work on the page. Not just in a physical book, but on the iPad too." In this comment, Karen demonstrates recognition that important skills are learned through transactions with both print and digital materials, but her concerns about the excessive use of digital material were observed repeatedly. An example of this was when I asked if she had any concerns about the amount of screen time to which the children were exposed and she said, "We have gotten better about policing him. Well maybe not policing [but] it does bother me." Karen referred to Aiden's frequent use of the iPad which was a growing concern for her throughout the study.

Jenny expressed similar views about the importance of digital skills in school. She expressed on numerous occasions that she thought that Makayla was learning valuable skills from using the iPad. For example, on one occasion, she said, "[Makayla] has a skill

set that I don't think she would have [had she not interacted with technology]. Not just the technology, but the math vocabulary that she is getting from those apps amazes me." Jenny went on to conjecture, "I wonder how much background she is going to bring to kindergarten just from interacting with the apps. I wouldn't have thought to expose her to it and all because it was just part of that app." Jenny's comment demonstrated her awareness that important skills were learned through digital content, but she qualified this by saying that she was "not ready to give Makayla open access to digital content" and went on to say that she wanted Makayla to "have the skills she needed to be successful."

Other adults in the children's lives also recognized the need for digital skills for success in school. Makayla's sitter (Debbie) demonstrated this when she said, "We bought Dalton (her son) a computer when he was just in the first grade to help him with his schoolwork."Debbie recognized that digital skills were necessary to prepare children for school and ultimately the work place:

> Becky: What are your views about the use of technology in the lives of children today?
>
> Debbie: With everything going to computers in the work place and even in our day-to-day lives. They will need these skills to be successful in the world. With all that is going on in the world. I think they need technology.

Debbie also recognized that she provided a model for using digital materials. She was aware that Makayla was always watching and learning from her actions. She indicated this when she said:

> Makayla and the other children like to take pictures with my phone, and she sees me texting her mama during the day while Jenny is at school. Sometimes I let her sit in my lap while I look things up on the Internet for the girls [the afterschool children] to help with their homework."

The Adults Sought Balance with Digital and Print Materials, but Expressed Pro-Print Biases

Throughout the study, the adults (including me) appeared to be in a quandary as we attempted to reconcile the use of digital materials with our own print-dominated literacy pasts. We recognized that mastery in the use of digital tools would include skill sets important for the children as they advanced through school, but we experienced mixed feelings when faced with the idea of allowing the children to spend a great deal of time using digital devices. In coming to understand this, data analysis suggests that the adults (a) sought balance for the children in the use of print and digital materials, (b) held distinct views about digital read alouds, and (c) viewed some digital engagements as real learning and some as play while maintaining pro-print based biases.

Adults sought balance in the use of print and digital materials. The idea of balance within materials and engagements with print and digital materials was a recurring theme throughout data conversations, interviews and observations. This was expressed by both mothers as well as by Aiden's teacher. For example, Karen expressed her desire for balance in the children's access to digital media and the kinds of engagements they experienced. An example of this occurred when I talked with Karen about the increased use of digital tools in schools today. I shared the fact that several of my nephews attended a school that had completely replaced print materials with iPads. Karen responded to this by saying "I don't think we will ever do away with print based books completely. Children will have to have a balance of both. There is just something about the physical aspect of holding a book or pen." Karen also expressed her desire for balance within the use of digital materials that provided opportunities for digital play and learning literacy skills when she said "if you are going to let them play on the iPad for an hour, let them

play games like *Angry Birds* (Rovio Entertainment, 2012) for thirty minutes and then make them do something like *Doodle Buddy* (Pinger, 2012) where they can write words or something like that."

As a classroom teacher, Jenny was aware of the expectation of children to learn about and through digital tools; however, she had mixed feelings about allowing Makyala unlimited access to digital materials. She was adamant that there should be balance within the kinds of print and digital materials with which the children engaged, and felt strongly that engagements needed to be mediated by parents or teachers. Jenny's desire to provide Makayla with balance was illuminated when she said, "I think the only way to feel comfortable is to continue to expose her to print and digital materials and to offer a balanced approach. We don't need to use an iPad as a babysitter…it is a tool."

Aiden's kindergarten teacher, also expressed the need for balance within the uses of print and digital materials used for instructional purposes. She shared that she felt that literacy today involved both print and digital literacies. She went on to say that children must have digital skills if they are going to be successful, but that there was a need for balance. She expressed a personal connection to this desire for balance when she shared that while she reads on her Kindle and iPad, she still enjoyed the way it felt to hold a book in her hands and even the way books smelled. I began to view the adults' need for balance as evidence of our own need to find balance between a nostalgic feeling about print materials and our awareness of the need to provide digital materials that would build important digital skill sets.

Adults held distinct views about digital books as read aloud engagements. Although Jenny was an active consumer of digital media, she still held print preferences

for Makayla's read aloud engagements. Jenny readily admitted that she preferred to read on her Nook for her own reading enjoyment because of the convenience and the availability of free or inexpensive books, but she preferred reading with Makayla in print books. Additionally, she regularly used her laptop and iPad to research products before purchasing them.

Emotional connections and digital read alouds. Jenny saw a clear difference between the emotional connections she could have with Makayla with print texts and those with digital materials. For example, late in the study, Jenny read online reviews of toys she was considering for Makayla for Christmas when Makayla requested to look at Dora toys on the iPad. Jenny compared this to print experiences of her own childhood:

> Of course, it was long before the digital era, but one of the things I loved for us to do when I was little was to get the Sears catalog at Christmas and look at toys with you cuddled up on the couch. Yesterday I had the iPad (it was 'my turn') and I was looking at toys to get ideas for Christmas. [Makayla] came over to me and said, 'Look, Dora toys iPad.' Just like we [referring to the two of us when she was a child] would have looked at the Sears catalog, Makayla and I snuggled up in bed and looked at toys together on the iPad.

At first I thought that Jenny's comments indicated that she felt that Makayla could experience the same emotional transactions through the use of digital materials that she had enjoyed as a child through transactions with print catalogs, but she qualified this when she later added, "it is just not the same as snuggling up with a book." Jenny's comment expressed her nostalgia about print-based media as well as her feeling that digital materials could not hold the same relationship value as could print materials. When asked if she felt that parents could replicate, with digital materials, the same *organic* experiences she described about transactions with print materials, she responded:

> I just don't think the human element can be there no matter how well it is read to you. No matter what interactions come with the app of a book or a story. There is

> no way to get that 'Oh Makayla, look at his face! What is wrong with Mamma? You can't get that without the side-by-side [referring to side-by-side oral reading from a print-based book]...there's just no way. For it to be organic, it has to be a relationship between two people and a book that happens to be in a digital form…I don't know.

Jenny was referring to the way that many eBooks read the book aloud for the child through the *read to me* feature. I clarified my question, wanting to know if the feeling she had experienced as a child, snuggling with Sears catalog could be replicated when she read aloud to Makayla from an eBook. She let me know very quickly that Makayla did not like for her to read to her from eBooks and preferred to engage with the iPad independently by accessing the *read to me* feature. This was evidenced in the dialogue that follows:

> Becky: Does Makayla let you read eBooks to her?
>
> Jenny: No, she won't. If I select a book on my Nook books to read to her, she knows how to take it back to the main screen and she will invariably pick something else. It has the *read to me* feature. It is like her way of saying 'you read your Nook by yourself; I'm going to read your Nook by myself.' So, I have not put a lot of eBooks on my Nook or iPad for her.

Social isolation, passive transaction, and digital read alouds. Jenny's quote above also demonstrates her concern that engagements with electronic books could be socially isolating. This was also expressed when Jenny said, "Digital literacy is so cold because it is so self-sustained, and it is usually an independent thing that doesn't have interactions. I mean interactions with people." Karen also expressed the concern that the children often chose to engage with digital devices as a solitary activity. The mothers seemed to see that kind of isolation as different from the solitary activity of a child sitting down to read a print book independently. They seemed to see a different quality to total engrossment with digital texts leading to what they saw as social isolation when the

children often ignored others around them. The adults were concerned that this might lead to passive engagement with the text. As Jenny said:

> It's like an algorithm. I find a book. I hit *read to me*. I sit here. It washes over me. It doesn't feel like you are engaging with the text. Let me just sit here and be a passive learner instead of interacting and digesting it.

A double standard? Digital read alouds are okay for adults but not for children. As discussed earlier, the adults valued print-based books and the capacity for reading aloud to positively influence literacy development of children. While both mothers indicated that they regularly read eBooks for their own personal reading enjoyment, they did not use digital books with their children. When the study began, I asked Karen if she had any eBooks on her iPad or iPhone she said, "Not really. I have some eBooks that I have read, but not for the children."

Likewise, Jenny did not have many eBooks on her digital devices that she had specifically downloaded for Makayla. I found this interesting because Jenny was an avid digital reader. She regularly downloaded and read eBooks on her Nook. She shared that she did have some digital versions of children's books on her iPad, but told me that she had downloaded them for her small group intervention students in her second grade classroom, not for Makayla. When I asked if she had the eBook of *Llama, Llama Red Pajama* (Penguin Group, 2011), she told me "I asked Makayla if she wanted me to get that book on my iPad and she said, 'No,' so I wasn't going to spend $6.95 on a book that she didn't want in the first place." Even during our conversation in the final member check, Jenny shared that she just did not like using eBooks with Makayla and still did not have many on her iPad or iPhone. This was demonstrated when she shared a screen shot of the folder that held the eBooks she did have on her iPhone (Figure 5.1).

Figure 5.1. A screen shot of the eBooks that Jenny downloaded to her iPhone for Makayla.

Likewise, Karen did not make it a habit to download eBooks for the children although she also enjoyed reading eBooks on her iPhone and iPad. Later in the study, Karen shared that she had downloaded some of the eBooks for children that had been made available on *Apps Gone Free* (App Advice, 2011) and that she tried to read them to the children but without much success: "I get frustrated with them because [Aiden and Madilyn] don't really want to listen to the books. They just want to do the activities that come with them."

Jenny shared with me that she was aware of her own mixed feelings about using digital books with Makayla. She said that she used digital books regularly with her second grade students, but she was not willing to relinquish the mediated interactions which she had with Makayla during their print book experiences. Jenny went on to share that she and Makayla "love books together and we do not love the iPad together." When I

asked her about this, she said that Makayla liked to work independently on the iPad. They rarely had the same kinds of interactive experiences that they had when she read to her from children's books.

Adults viewed some digital engagements as real learning and some as play, but held pro-print bias. The adults in the study saw the need for the children to develop digital skills for future success; however, they did not feel that all digital engagements provided the same opportunities for learning. One way this was expressed was in the kind of language the adults used concerning digital engagements. At times digital engagements were referred to as real learning experiences and at other times as play. I was first presented with the notion of *real learning* in digital spaces one day as Karen and I talked prior to the initial interview. She discussed Aiden's use of the iPad, and shared how she preferred that he spend time on games that involved *real learning* as opposed to just playing games like *Angry Birds* (Rovio Entertainment, 2012). When I asked her what she meant by this, she said that she meant concepts like "learning letter sounds, his numbers, or how to read his popcorn words [the high frequency words he was required to learn in school]."

On several occasions I heard Karen use the term *learning game* with Aiden when she discussed games that he wanted to download on the iPad. Karen also used the term in her interview when she described an application that she downloaded for Madilyn called, *Fruit Ninja* (Halfbrick Studios, 2012). She said, "It is not really a learning game. You slice this fruit into pieces, it's some kind of fruit Ninja game, but I also have this Dora game that helps her learn her letters." Aiden became aware of this differentiation between games for play and games for *real learning* probably instilled by his mother. This was

demonstrated one day when he asked for access to the iPad. He said, "Nana, if you will let me play my racing game, I will play a real learning game."

In this way, the adults often differentiated between the use of digital materials that taught the children content (such as the letters, colors, or sight words) and the use of digital materials that were "just for play." This distinction between real learning and play became more apparent throughout the study. At the same time, the adults often referred to all digital engagements as play. For example, Jenny frequently asked Makayla, "Which app do you want to play?" communicating that this was a play activity rather than a learning activity. And, as I wrote this dissertation, I found myself using the word "play" in conjunction with the children's digital transactions, later going back and changing most of those references to the words, "transact with."

Karen expressed her differentiation between digital learning and digital play when I asked her how much time Aiden spent on the iPad while at home. She said "A *lot* of time! He will play it until you stop him from playing it…I prefer him to play the games that he can learn from." Karen again expressed that she preferred games that taught him the content he was expected to know in kindergarten such as number sense or letter sounds. "We have a little doodle app on the iPad that Aiden can write his letters, and I don't mind him playing those games. He is learning a lot of things from doing that." When she discussed Aiden's television viewing habits, Karen expanded on her view that some digital engagements were just for entertainment and others taught content. She said, "He likes to watch things that don't always teach him a lot, like *Phineas and Ferb* (Disney, 2008). Every once in a while he will watch Dora and he learns a lot from that."

Karen felt that Dora was an acceptable use of television viewing time because the children learned a lot of skills through watching it.

The parents repeatedly referred to *Dora the Explorer* (Nick Jr., 2012) favorably in terms of its teaching/learning potential. The mothers indicated that the *Dora* television program taught many skills including an awareness of other languages. Karen shared that the children occasionally said words in Spanish describing an instance when Aiden wanted Madilyn to hurry and said, "*Vamanos!"* Jenny shared that Makayla sometimes practiced words that the character Dora asked her to repeat. Jenny said, "She has started to talk back to the television. She sits and listens and then whispers back to herself." On one occasion, Jenny shared that Makayla had tried to get her purse open and shouted, *"Abre, abre, abre."* Jenny said, "That is the Spanish word for open. Makayla wasn't speaking English, she was struggling with the bag and she told it to open and expected it to work." When I asked if she thought that watching Dora and using the Dora applications on the iPad might help Makayla learn Spanish she said:

> I think she will have a functioning vocabulary, but I don't expect her to be fluent in the language just from watching Dora. It is not immersion, it is exposure, I'm not sure it will make her bilingual, but it will make it a lot easier when she learns it [Spanish] in school. She will have the basic things we got in intro to Spanish. She will have it.

Later in the study, Karen recognized the level of expertise required by the children to engage in many of the applications beyond play. For example, when she discussed an art application on her iPad that allowed Aiden to create different scenes she stated, "It amazes me how much he does on that. You can change the size and thickness of things. He knows all about that kind of thing. I was thinking it was a waste of money." She also validated that Madilyn learned many new skills using digital tools such as how

to manipulate content on the touch screen when she said, "The place that I have seen her grow the most is on the iPad and digital type things. Her fine motor skills have really grown. She didn't really have them before." However, while the parents and I recognized that the children learned a great deal while engaging with digital tools, we still held pro-print bias and an uncertainty about regularly allowing the children access to digital materials. These feeling were best exemplified when Jenny said:

> I'm still probably biased toward print forms of literacy... I am still kind of wary of it [technology]. She [Makayla] has to have a certain amount of understanding, and I know she will need these skill. I know when she gets to school that is what she is going to have to be able to do, but I don't want to lose what makes her. And it is just so easy when you are sitting there silently with yourself interacting with technology.

Adults Controlled Access to and Content of Print and Digital Materials

Throughout the study, opportunities for access to both print and digital materials were largely controlled by the adults in the lives of the children. Adults (including me in my role as grandmother) served as gatekeepers within both print and digital environments. This included making the materials available and accessible. To be accessible to the children, print material had to be purchased or checked out from the library and placed within reach. Access to digital material was dependent on an adult's choices about purchasing devices and the decision to download applications. While many of the applications were free, the adults still controlled final decisions about downloading them. As I considered the role that adults played in children's access to print and digital materials I learned that adults (a) controlled access to print materials and at times, engagements, (b) controlled access to digital material and engagements, (c) purchased materials based on the children's interests largely influenced by television, and (d)

controlled the access the children had to culturally diverse and gender stereotyped content.

Adults Controlled Access to Print Materials and Engagements

Analysis of data suggests that the adults in the study controlled the availability of, access to, and at times, engagements with print-based materials. And, when accessing print material, the children often depended on the cooperation of adults to read to them. While at times the children brought books to their parents or me to read, our willingness to take the time to read the text determined whether or not the children fully experienced the book. Likewise, adults determined the opportunity to access print materials independently by providing the materials and by placing them within easy reach of the children.

For example, on one occasion while visiting my mother's house, Makayla found a book that she recognized in the toy basket. When she picked up the book she said, "Spot" and walked toward me carrying the book. I interpreted her actions to mean that she wanted me to read to her. I was talking with my mother at the time, but immediately stopped our conversation to read the book to her. Makayla initiated this read aloud, and I willingly read the book to her; however, I could have just as easily (and I am sure I did at times) denied her request and continued on with my conversations. My decision to respond to Makayla's request allowed her to access the book differently than if I had ignored her or refused to do so.

On another occasion, Madilyn brought a book for me to read to her while I was busy making supper one evening. She said, "Nana, will you read me this book?" I responded by saying, "Not right now, run and play." Madilyn returned to the living room

and put the book down on the end table. She sat down beside Aiden and watched him as he played with the iPad. As I reflected on these two isolated incidents, I considered how I controlled the opportunity for engagements with the children and books when they were in my care. However, while the other adults and I controlled the print materials that were purchased, checked-out from the library, or made available within reach of the children, we never prevented the children from engaging with print materials when they chose to do so on their own.

Adults Controlled Access to Digital Materials and Engagements

Throughout the study, adults repeatedly exerted control over access to digital materials with which the children engaged. We controlled the amount of time the children were allowed to engage with the devices as well as the content on the devices. An example of this occurred when Aiden and Madilyn were riding with me to town. As soon as we got in the car Aiden said, "iPad, please." Madilyn added, "iPhone, please." I responded to their requests by handing Aiden my iPad and Madilyn my iPod. I reminded her that I did not have an iPhone. She giggled and said, "iPod, please."

On another occasion while I was at a restaurant with Aiden, Madilyn, and my husband, Aiden asked to play the iPad. Henry (my husband) responded by saying, "No, you don't need to play that right now." Aiden looked at me as if to get a second opinion and dropped his head. He was obviously disappointed that his grandfather would not allow him to play the device, but did not question the decision. I recognized that we were exercising our adult prerogative to allow or deny access to these devices and that this was really a form of control (perhaps control we would not have exerted if the children had asked to read a book). Data suggest that the adults controlled access to digital materials

and their contents out of concerns about (a) the cost of the devices and the applications, (b) the excessive use of devices, and (c) exposure to inappropriate digital materials.

The cost of the devices. One reason that the parents and I were cautious about providing unlimited access to digital devices was because they were expensive. Member checking confirmed that this was due to the cost of digital tools compared to print-based materials, as well as the danger of the children damaging the devices if they dropped them. My iPad was purchased with my personal funds and cost over $500.00. Karen confirmed that her iPad had cost over $500.00 as well. Jenny's iPad had been purchased by her school, and while she allowed Makayla to use it over the summer, she was responsible for ensuring that it was not damaged. To ensure that this expensive item was not dropped and broken, while in my home, I always asked the children to stay seated while they used it. On several occasions I pushed the iPad away from the edge of the table and reminded the children to "be careful" or if they got up to show me what they were doing on the device, I told them to "sit back down, you don't need to walk around with the iPad."

Jenny expressed concern about Makayla having open access to an expensive device when she said, "I am not crazy about the idea of Makayla dropping that $800 iPad, but she needs to have access to it and I pray that she doesn't drop it." Late in the study, Madilyn did drop Karen's iPad from the top of the bunk bed and cracked the screen. Even Aiden's InnoTab (which was designed to be more durable) was broken at that time.

Tensions regarding excessive use of digital materials. The parents were concerned about the children's excessive use of, and exposure to, digital materials. According to the Pew Report (2012) these concerns are not uncommon and are often

grounded in concerns about cyber bullying, inappropriate content, and the lack of physical activity due to excessive gaming. In this study, the adults' concerns about the excessive use of the devices often led to tensions about the amount of time the children spent engaged with digital tools and their unwillingness to engage in conversations while doing so. This tension was demonstrated regularly. One example comes from an evening when Aiden was spending the night at my house. I had picked him up earlier in the day and his father came later to bring his clothes for him to spend the night. When Jason (Aiden's father) entered the house, Aiden was on the couch playing a game on the iPad. Aiden did not look up from his digital racing game to acknowledge his father's presence, nor did he answer him when he asked him what he was doing. Jason told Aiden to turn off the iPad and said that he could not use it the rest of the evening. Aiden was visibly upset as he cried and tried to apologize for his actions. I respected Jason's wishes and that evening was spent iPad free. Aiden and I read books, watched television and played several games of chess. This event made me realize that I had given Aiden open access to use the iPad at his own discretion and that this was not only problematic in his parent's eyes, but caused tension between them.

In an attempt to bridge the growing tension surrounding the use of digital tools, I decided to have a lesson with Aiden about digital etiquette. I began this lesson by asking why his father became angry with him and what he could do to avoid this in the future:

Becky: Tell me why you go upset last night when your daddy said you couldn't play the iPad anymore.

Aiden: [Aiden did not look up and did not respond to the question.]

Becky: How did it make you feel?

Aiden: Bad because I wanted to play the iPad.

Becky: What could you do to solve that problem?

Aiden: Stop playing it.

When Aiden responded to my question by saying, “Stop playing it,” his entire being appeared defeated. His shoulders drooped and he leaned his face into the palm of his hand with a look of despair. I talked to Aiden about solutions other than to just stop playing with the iPad. I asked him to brainstorm ways to solve the problem. He told me that when people entered the room while he was playing his racing games, he could stop playing and look at them and listen to what they wanted to say. He suggested that we make a *test* to see if he could remember to do it. He told me the next time someone came in the house I could check to see if he passed the test.

Several hours passed and I had forgotten about the *test* when Jenny came in the back door. We talked for a bit before Aiden said, “Nana, did I pass the test?” I had failed to notice that Aiden had stopped playing the iPad and put it down beside him when Jenny came into the house. This was an important lesson for him, but it also reminded me that, in my attempts to allow the children to self-select from the print and digital tools in my home, I had created a tension within my stepson’s family. I hoped that this lesson in digital etiquette would relieve some of that tension and help Aiden to self-regulate his attention more in the future.

Concerns about inappropriate content. The adults in the study also expressed concern about the children having open access to inappropriate content. While this was repeatedly expressed by the parents, I experienced it personally. Prior to the study, I had not given much thought to the applications I downloaded on my digital devices. I based choices on my need as an educator and my own personal productivity needs. During this

study, however, I became very aware of the need to monitor the content accessed by the children because Aiden regularly asked me to download applications. I noticed that these applications had short summaries of what the application offered, but also provided a suggested age range which was written *4+* or *9+,* indicating that the application was appropriate for ages four and up or ages nine and up. Some applications suggested for ages 12+ and 17+ included rationales such as "frequent/intense realistic violence" or "infrequent/mild horror/fear themes." However, on closer inspection, a recommendation of 4+ did not always guarantee what I considered to be age appropriate content.

For example, on one occasion Aiden asked to download a racing application called, *Crazy Monster Truck- Escape* (GameAnax Inc, 2012). He had learned how to access the iTunes store and knew how to type the word, *car* in the search box. He located a game he wanted to download and said, "Look, Nana, it says age four." He pointed to the precise location of the age recommendation in the description of the application. I downloaded the application, and Aiden accessed it from the home screen of my iPad. I was immediately struck by the sound of police sirens screaming over the sound of the background music. The application involved the drivers of monster trucks running from the police. When I examined the application closely, I saw that the characters on the home screen had angry expressions and the women were scantily clad. The truck that Aiden selected to begin the race (chase) had an image of skull and crossbones on the bedcover. This was not as age appropriate for a four-year-old as the application description had indicated.

Karen also indicated that this was a concern when she told me why she did not allow Aiden to see her enter her password to download apps. "I won't let him see me

because he has downloaded things before that I didn't think were appropriate for him. That is why he turns his head now when you enter your password." Even Dalton, (the 19-year-old son of Makayla's sitter) expressed some concern over the children having access to digital content:

> Becky: What are your views [about the children's use of technology]?
>
> Dalton: At the same time you feel sort of spoiled by it. There still doesn't need to be that independence. It needs to be in proportion. I will admit I was up until 4:00 a.m. playing video games.
>
> Becky: Does she ever see you play video games?
>
> Dalton: I try to avoid it. If there is an old one like *Spiro* that is age appropriate, and is really colorful. They like it.

Dalton's comment revealed his awareness that there was digital content which he felt was inappropriate for the children and that there was a need for adults to monitor access to that content.

Exposure to objectionable content through advertisements. The adults frequently expressed their concerns about the digital materials the children were exposed to through unsolicited advertisement. These advertisements often popped up during the children's digital engagements to encourage the purchase of other applications or to unlock additional features of the application. Jenny expressed concern about this when she said, "There is a so much out there [cyberspace] that I am not ready to give up control over what Makayla has access to." Jenny expanded on this saying, "Advertisement bothers me. I don't like the idea of her being lured into that. I want to make that choice for her right now."

Deleting content. Adults not only controlled access to content by selecting applications to download, they also controlled access by choosing to delete certain

applications that did not meet their approval or that they determined were too difficult for the children to use at that time. Prior to the study, I was not aware of how to remove content from my digital devices, but I became aware of this when Aiden sat in church one morning and accidently activated the delete mode on my iPod. When this happens, the icons shake and an X appears beside each of the applications. When the X is touched, the application is deleted. On this occasion, Aiden had deleted several applications before I realized what he had done. He was devastated when he realized that he had deleted his favorite art application, Doodle *Buddy* (Pinger, 2012). I assured him that I could restore the applications when we got home (although at the time, I was not certain how that might be done).

On a separate occasion, I was reminded again about deleting content while Aiden was trying to access an application on my iPad. I noticed him scrolling through numerous pages of applications as if he were in search of something when he said, "Nana, did you delete my Disney app?" His voice sounded as distraught as if I had thrown away a beloved stuffed animal. I reminded him that it was in a folder and showed him where it was located.

Following this incident, I asked Jenny and Karen if they ever deleted content from their devices. Jenny told me there had been times when she deleted applications that Makayla did not like. She also shared that she deleted some applications that Makayla had outgrown like *Sound Touch* (Sound Touch, 2012), an application that provided sounds of objects in the world such as animals, vehicles, and musical instruments. When I asked why she deleted it she told me that "it takes up space on the iPad, and Makayla wasn't using it anymore." Karen shared that there were apps she had deleted because

"they were too hard for Aiden and Madilyn." I also periodically deleted content when an application did not meet my needs or expectations.

In many ways, these deletions were no different than an adult going through a child's collection of books and culling out books with which the children no longer engaged or had outgrown, such as the board books they liked when they were babies. However, adults did ultimately control what got downloaded and what was allowed to remain accessible on digital devices.

Adults Selected and Purchased Materials Based on the Children's Interests Largely Influenced by Television

The adult participants controlled the content of print and digital materials but often selected and purchased these materials for the children based on the children's interests. Many of the toys owned by the children also reflected the influence of what Steinberg (2010) referred to as *kinderculture* (the pop culture of young children based on the cultural worlds in which they interact). These interests were often influenced by media and developed from watching movies, videos, and television. Many of the print materials in the children's home and in my own home featured characters such as Dora, Sponge Bob, and the Disney princesses. These characters became very influential in directing the children's interest in print and digital materials and the mothers and I were often led to purchase related books and digital applications upon the children's request (Figure 5.2.)

Figure 5.2. Examples of print and digital materials that represented kinderculture

This was repeatedly supported in the data, but an example of a time when the children's interests guided adults' purchases occurred as I considered the purchase of an application on my iPad that would allow the children to create works of art while supporting their growing understanding of letters and letter formation. I was immediately drawn to an application that featured the character Super Why, one of the children's favorite television characters. I downloaded the application and it quickly became one of the children's favorites alongside *Dora's Dress Up Adventure* (Nickelodeon, 2012) also a favorite because of a favorite television character. As I considered my choices of application for the children, I became increasingly aware of the influence of pop culture on the children's interests in toys as well as print and digital materials.

While I did not analyze data about the children's television viewing habits, television viewing was certainly influential in directing the children's interests and subsequently purchases in terms of toys, print material, and digital materials. I was not completely cognizant of the influence that television had on the children until I began reflecting on the data and noticed how many of the books and apps I had purchased reflected television culture. The characters with which the children became enamored and

sought out in print and digital materials were often met for the first time through watching television. Television clearly influenced their interests which, in turn, were picked up on by parents when they selected digital applications to download for the children. As noted in a previous finding, the children had easy access to television in home settings and the programming choices were often made to allow the children to view favorite shows such as *Dora the Explorer* (Nick Jr. 2000), *Super Why* (PBS Kids, 1995), *Mickey Mouse Clubhouse* (Disney, 2006), *The Fresh Beat Band* (Nick Jr., 2007) and (one of Makayla's former favorites) *Blue's Clues* (Nick Jr. 1996).

In spite of this finding, the parents did not see television as a major influence on their children. As discussed in Chapter Three, neither mother listed television as a technology to which the children had access (although they may not have perceived television to be a technology), yet televisions were present in the family rooms of all home data collection sites and were turned on most of the time that the families were at home. The parents did not seem to share my concerns about the harmful effects of too much television. Televisions were the focal point of the living space of each of our homes, but little thought was given to the impact that television viewing had on the children other than one instance when Jenny expressed that she had "a lot of guilt about how much TV she [Makayla] watches. I am guilty of turning the television on Dora so I can have time to read." Similarly, Karen mentioned television briefly in her interview when she discussed Aiden's habit of watching television programs "that don't always teach them a lot."

Other than these few comments, television was rarely, if ever, mentioned by the adults. I wondered if concerns about television as a media influence had gone

underground as a threat or worry for these parents. The new media threat seemed to be the unsolicited advertisements on digital devices which threatened to expose the children to what parents perceived to be inappropriate content. As Jenny explained:

> The danger of using the iPad is all the unsolicited advertisement on it. Even on her apps, there will be pop-ups that are trying to get you to upgrade or buy another app…It frustrates me because I don't know if it is appropriate for her.

This response demonstrated that, when Jenny thought of media, she immediately thought of the iPad rather than television. I mention television here because I see it as a technology and because the spin-off market in the book and digital application industry capitalized on the children's interests influenced through television.

Access to Diverse Cultural Perspectives

It was not until after I had analyzed the data and was writing this dissertation that I began to consider, in-depth, one of this study's sub-questions which was to look at ways that print and digital materials concealed and revealed information. As I considered this question, I realized that concealing and revealing in this study depended largely on choices made by adults and were therefore dependent on our preferences and perspectives. This included our *obliviousness* to lack of racially, culturally, socially, linguistically diverse materials that we chose for the children's use. This alone limited the children's access to diverse perspectives. As gatekeepers, the adults ultimately held the keys to the kinds of materials that were made available and to the messages sent by those materials to the children. We had the opportunity to open or close off access to diverse perspectives.

As I examined the print and digital content to which the children had access in my home, I realized that the characters and cultural messages within my digital and print

materials mirrored that of my own family. While I was aware of the need for children's literature to reflect diverse perspectives (I had a large collection of culturally relevant books in my collection at school), I had not made those titles available to my own grandchildren. Furthermore, I had not considered the importance of cultural diversity when I made decisions about the applications I provided for the children on digital devices. On closer inspection, I realized what had been concealed and revealed was my own cultural bias reflected within the materials I made available to the children.

My paper doll epiphany. As discussed in Chapter Four, many of the materials to which the children had access in my home reflected evidence of dominant culture bias (through omission or stereotype of races and ethnic groups other than European American) and gender stereotyping. For example, one application that I chose to download for Makayla and Madilyn was called *Chic Baby* (Touch Apps, 2012), a virtual paper doll application that invited users to dress a baby doll in various outfits. It was during the analysis of data about this application that I recognized the critical role I played as a gatekeeper in providing the children with diverse content – or not. In fact, I distinctly remember the precise moment at which I realized that I had not *once* considered diversity when selecting materials with which the children would engage in my home. I was transcribing a video tape of Aiden as he tried to access an application on my iPad, when I was struck by the sound of my own voice as I explained to Aiden why he could only access the blond, blue-eyed paper doll in *Chic Baby* (Touch Apps, 2012). Aiden and I were in a restaurant when he tried to access the application for the first time. He repeatedly tried to access the doll that had darker skin, brown hair, and was wearing a bandana. The dialogue which followed proved to be an epiphany for me:

Becky: That is the paper doll app that I downloaded for Madilyn and Makayla.

Aiden: Why won't it let me pick this doll? Is it locked?

Becky: Yeah, I just downloaded the *lite* version of the app, and it only unlocks the blond baby. You have to pay to unlock the other ones.

My words reverberated in my mind as I listened to that video and typed the transcription. I realized that the way I had responded to Aiden perpetuated privilege and bias on so many levels. First, my words implied that I had downloaded the application for the girls because girls play with paper dolls, and second, I chose not to pay to unlock the other levels which would have allowed the children to experience a more diverse (albeit somewhat stereotypical) representation of other races within the application. If I had selected this *for fee* option in this application, I would have at least provided the children with different options when engaging with this application and opened them up to diversity through the ability to access children of different ethnicities. The blond, blue-eyed paper doll was the only doll that was unlocked and available to dress in the *lite* version (for free). The other dolls had small locks on the bottom right corner of each of the pictures (Figure 5.3).

This realization came well after the data collection period and led me to closely examine the kinds of materials that I made available for my grandchildren. As discussed in the previous chapter, this examination led to the realization that much of the content which I deemed age-appropriate and acceptable lacked cultural diversity and at times perpetuated cultural, racial, and gender stereotypes. I had subconsciously perpetuated these stereotypes in my choices of materials. It was disquieting to me that I had remained oblivious to this aspect of the materials I made available.

Figure 5.3. A screen shot of the home page of the application for the iPad, *Chic Baby* (Touch Apps, 2012)

A final member check about culturally relevant materials. In my examination of cultural and gender bias in the materials to which the children had access, I chose not to include the families' print and digital content. I felt that this would be an intrusion on their lives, especially since I came to this realization so late in the study. However, I did share the findings about my revealed biases with Jenny and Karen during the final member check. I wanted to make them aware of my new understandings about the content of the materials that I had made available to the children. The conversations we had led all three of us to new understandings about the ways that materials can perpetuate and even create bias. Those conversations are explored in discussions of adult learning in the following section.

The Adults Expanded Their Understandings Through Participation in This Study

Street and Heath (2008) contended that participants are often greatly impacted through participation in qualitative studies. This was the case with this study as the adult

participants and I expanded our understandings about the ways that the three children used and learned through print and digital tools. Specifically, as the adults noticed the ways that the children used print and digital materials, they experienced (a) a deeper understanding of literacy and an expanded definition of texts, (b) a greater awareness of the print and digital skills needed for school success, (c) shifts in the way they viewed real learning in print and digital materials, (d) an increased awareness of the dominance of White, middle class, English-speaking cultures and gender stereotypes in print and digital materials, and (e) I confronted my own biases.

An Expanded View of Texts

Throughout the study, drawing on the work of Harste, Woodward, & Burke (1984), I viewed texts as anything that had embedded meaning. This understanding recognized the multimodal nature of texts and the many ways that messages are embedded through multiple sign systems. Therefore, I viewed texts to include multiple forms of communication such as books, environmental print, advertisement, digital applications, websites, video, music, and artwork. The mothers in the study experienced moves from a much more traditional view of texts as only paper and print to this broader definition.

This was particularly true with regard to their views of digital tools as texts. Early in the study, Karen viewed literacy as the ability to read and comprehend print texts. She viewed Aiden's early reading skills as primarily related to identifying sight words and recognizing letters and words in environmental print. After participating in this study she viewed literacy differently. She stated, "It is learning how books work, how words work on the page. Not just on a physical book but on the iPad too."

The adults also developed an expanded understanding of the ways that digital tools could be used for communication and the children's growing awareness of those uses. One example of this occurred in an exchange Karen and I had within the social networking site I provided for the parents. Karen had posted a picture of Aiden sitting at the kitchen table one morning. Through her post, she shared that he suggested that she could stay home from work to be with him and just use *Skype* to do her work that day. She expressed her surprise that Aiden knew what it meant to *skype*. She wrote, "Aiden asked me this morning why we couldn't just Skype instead of going to work." After I responded, Karen called me to ask how Aiden knew about Skype. I shared that, several days before, Aiden observed as I skyped with my doctoral advisor to discuss data collection for this research. It fascinated Karen that Aiden had been able to see the ways in which this skill could transfer to solving a problem in his own life (his desire for his mother to stay home from work with him). This in turn expanded her understanding of Aiden's literacy development and the role played by digital literacies in that development.

Another instance that exemplified how Karen's understanding about literacy was expanded was when she discussed Aiden and Madilyn's understandings about digital concepts and skills. Early in the study, she did not perceive Madilyn as possessing any digital knowledge. She told me that Madilyn was content to be read to and that "with the iPad . . . She does not know how to get anywhere on it." Late in the study, her views had changed and she was able to articulate Madilyn's digital expertise. "The place that I have seen her grow the most is how she works on the iPad and on digital type things. Her fine motor skills have grown. She didn't really have that before."

As an elementary classroom teacher, Jenny began the study with a broader understanding of literacy. Her teacher preparation courses and professional development had provided an expanded definition of literacy. Jenny defined literacy to include multiple literacies including social and digital literacies. She was aware of the skills required to be technologically literate and the ways that symbols allowed humankind to make meaning in the world. However, through this study, she expanded her views about the definition of *text*.

Initially, Jenny understood *text* to mean, print-based, a view revealed on one occasion when Jenny's comments led me to believe that she did not view other media as *texts*. This incident occurred during a conversation we had about Makayla making a connection between a *Dora the Explorer* (Nick Jr., 2000) video and her own life. I distinctly remember the look of surprise on Jenny's face when I suggested that Makayla had made a text-to-self connection. Her cognitive dissonance was apparent as she corrected me and said, "She made a media-to-self connection." We continued the conversation, and I shared with her my interpretation of the expanded definition of texts to include all venues of meaning making whether it be a book, an application, a video, a podcast, or a piece of art, or music. In retrospect, I thought it was ironic that neither of us considered the prevalent use of the term *text* as a verb to describe messaging within cell phones or other digital devices.

Additional data supported my belief that, because of the study, Jenny expanded her definition of *text* to include additional texts such as messages in advertisement, videos, and applications. In a final member check, Jenny expressed this deeper understanding when she said, "My understanding of the term text has expanded to

include any accepted set of symbols that a person uses to derive meaning from the world." Additionally, Jenny's growing awareness was evident in her final interview:

> Becky: Has your definition of texts changed?
>
> Jenny: I think I see symbols more than I have ever seen them. Numerically, numbers are encoded with meaning just like words are. There are whole arrays of symbols that we make meaning from…How much of our language is body language and symbols and icons. It is like when Makayla finds her apps; she is connecting that icon to what she wants. I am seeing things in a different light. It [taking part in this study] has made me more open-minded…I think we read images more now than ever.

Jenny extended this new way of knowing to the students in her classroom when she said, "I don't think I used to think much about other ways people make meaning." She went on to share how one of the children in her classroom had a mother who was deaf. "Sign Language was her first language. Some people don't see American Sign Language as a language. Taking part in this study helped me think about how she is losing that because her brothers are interpreting for her."

Greater Appreciation for Digital Skills as Important for School Success

Throughout the study, the parents developed a deeper understanding of the need for the children to develop digital skills. They recognized that there was an increased emphasis on technology skills in schools today, and realized that the children would be expected to possess certain skill sets to be successful. This added a new set of expectations for the children as the parents concerned themselves with ways they might help prepare their children to enter school. Whereas former generations were concerned with teaching children skills such as letters of the alphabet and colors, these adults recognized the need for the children to possess certain digital skills as well.

Jenny expressed this repeatedly, but it was best evidenced when she said, "[Makayla] has to have a certain amount of understanding, and I know she will need these skills. I know when she gets to school, that is what she is going to have to do." This demonstrated that, as a parent, Jenny was aware that school would impose certain expectations on her child, and she felt it was her responsibility to expose her to things that would prepare Makayla to meet those expectations.

This was also evidenced in a conversation that I had with Aiden's parents just after Aiden started five-year-old kindergarten. Aiden's parents expressed their concern that Aiden would be taking a literacy test on the computer for the first time. I talked to them about how adept Aiden had become as he navigated through applications on the iPad and pointed out that these were touch screen skills. I asked if they ever let him use the desktop computer so he could practice using the mouse since he would need to do that when he took the Measures of Academic Progress (MAP) assessment when school started. Hearing that Aiden's literacy skills would be assessed on a computer seemed to change how Jason and Karen viewed Aiden's use of digital materials as well as validating his digital knowledge as useful for school style literacy. They made it a point to allow him to practice using the mouse so that he would be able to successfully demonstrate all that he knew when tested in the fall.

Shifts in Views About *Real Learning*

In addition to developing a deeper understanding of the need for digital skills, the adults experienced shifts in the way they viewed print and digital materials. One example of this was in the way Karen responded to a question about Madilyn's use of plastic letters (a material that I view as print-based). Following a brief discussion in which Karen

expressed that Madilyn was not yet beginning to notice and name letters in environmental print, I asked about the plastic letters that I kept at my own home. Madilyn used these letters on many occasions; she moved them around on a metal pie pan and had begun identifying various letters that were in her own name. I asked about this because I knew that Aiden had played with a similar set of letters in his home when he was Madilyn's age. The dialogue from the interview demonstrated a shift in Karen's thinking about print and digital materials:

> Becky: Does she have any plastic letters at home? She likes to play with the ones I have here. She likes to dump them out and use them on a cookie sheet.
>
> Karen: Oh, on a cookie sheet? There is a game called *Letter Factory* for the Leap Pad that teaches the letters.

Karen had made a connection from the plastic letters (print-based literacy) to the use of a digital tool as a means of helping Madilyn learn letters. She considered this to be an example of a digital application that provided real learning experiences. Karen was beginning to see applications as a means of mediating literacy learning for her children. This was a significant shift from the views she held about learning in digital environments earlier in the study.

While the parents in this study did experience shifts in their thinking about the validity of skills necessary to transact with both print and digital materials, they remained in a quandary about their feelings about the children's digital appetites. Even toward the end of the study Jenny readily admitted to a pro-print bias:

> Becky: Has this research caused you to think differently about the ways you use print and digital materials with Makayla or the students you teach?
>
> Jenny: I don't feel like my opinion on it has changed that much. I am still probably biased toward print forms of literacy or reading or however

> you want to look at it. I just know that Makayla will be much more comfortable interacting with it [technology].

At the same time, member checking conversations led me to believe that Jenny's views about digital material had changed to encompass new understandings about the Makayla's learning through the use of digital materials. This shift in thinking was evidenced when Jenny discussed Makayla's favorite application:

> Her favorite app is still *Bug Games* but she used to just stay on the song, now she does the puzzles and the math…she knows so much that I am not aware of…she has a skill set that I don't think she would have. It is not just about [how to use] technology. The math vocabulary that she is getting from those apps amazes me.

Makayla's sitter (Debbie) and her son (Dalton) were also impacted by the study. While they were aware of the importance of print and digital materials in the literacy development of the children in their care, this study helped them understand more about the ways that caregivers can impact literacy development through interactions with print and digital materials. One example is found in the interview conducted as Debbie expressed her feelings about digital tools:

> Becky: What are your views on the use of technology in the lives of children?
>
> Debbie: With everything going to computers in the workplace and even in our day-to-day lives. They will need these skills to be successful.

Data also suggest that Dalton's understanding of literacy was expanded as I discussed music as a form of literacy. I shared a story about how Makayla surprised me one day as she tapped on the keys of my piano as the pointed to the notes in a music book and thumbed through the pages. This surprised me because Makayla had never seen me actually read music because I usually played from memory. I explained to Dalton that Makayla was emulating the way he read musical scores to play music on his keyboard

and guitar. Dalton confirmed that Makayla did turn the pages in his music books and pretend to read and play the keyboard when they were together. Through our discussion of Makayla's growing awareness of music, Dalton came to recognize the important role he had in Makayla's musical literacy development as she observed him transact with musical notation and with a variety of instruments.

Awareness of Adult Choices and Introducing Racial Bias and Gender Stereotypes

I presented my findings to Jenny and Karen during a final member check late in the writing process. Throughout the study and writing process, I looked forward to this meeting as it would allow me to share the many photos and stories about how their children had grown as literacy learners as they used the materials in their world. However, I had reservations about presenting my findings about cultural and racial bias and gender stereotype. I had previously experienced tensions with colleagues while confronting the same issues. Confronting these issues with my own daughter and daughter-in-law left me almost paralyzed with fear that they would be upset at the direction I had taken in presenting this finding. I imagined they would ask me questions or make comments such as, 'What does this have to do with my children?' or 'That is ridiculous, I am not prejudiced.' Actually, I imagined them asking the same questions and making the same comments I made when my biases had been confronted years before (Long et al, 2008). I knew how hard these conversations were, and I would have avoided them if I could have done so in good conscience. I debated long and hard about how to present this finding to Jenny and Karen

I first tried to ease it into small talk with my daughter, Jenny, as I discussed where I was in the writing process and some of the findings that I found particularly pertinent to

her work as a media specialist. I shared my paper doll epiphany and tried to keep the focus on my own learning. I talked about the importance of culturally relevant materials. She agreed and shared that she had an extensive selection of culturally relevant children's books that she used with her students. She felt that I was probably much more sensitive to issues of racial differences because I had been born into a segregated South. She felt that, because she had always gone to school with African American, Latino, and White children, she just did not see the differences in her own life experiences and people of color that were so apparent to me through my observations of privileging and omissions within the materials. I tried to revisit my findings related to racial and ethnic privileging in print and digital texts on several other occasions and Jenny assured me that it really was not an issue; in fact, she called it a "non issue." I wondered if others her age shared similar feeling and if in fact, I was making something out of nothing.

When Jenny and I met for the final member check, I once again brought up the issue of culturally relevant materials. I showed her the analysis of the content of my digital devices and pointed out how the collection of children's books in my home showed even less diversity than in the content of the digital applications I downloaded for the children's use. She assured me that she knew that I probably had a large collection of culturally relevant books in my school book collection. And she was right. I did have an extensive collection of books that reflected diversity, but I pointed out that it did not matter how many books I had at school if I did not bring them home to read to the children. I asked Jenny to reflect on this and write to me at a later time. This is what she wrote:

> I believe strongly in preparing Makayla to be a successful, functioning member of society. To achieve that goal, I know that she must understand cultures other than

> her own. Most of her books and apps include animals as characters. She does have books with the characters Doc McStuffins and Dora the Explorer. Those same characters are reflected in her apps. No other cultures other than those are reflected in her books or apps. As an educator, I know that culturally diverse materials are important. I believe that generally speaking, the apps are created by the market and for the perceived market. I wonder if the book and app markets are narrowed by the cultures that create them. It leads me to ask, 'how diverse are the writers of these media types?' As a librarian I think these are big questions that need answers.

Jenny's reflection demonstrated that our conversations had led her to expand her awareness of cultural relevancy and to consider the content of the print and digital materials she made available to Makayla. Although she was removing her own agency from this process and giving responsibility to "the market", she was beginning to think about the lack of diversity in the materials her daughter used. She was beginning to explore the larger structural issues – big businesses that create products and discriminatory targeting to a White, middle class market – that are foundational to the beginning to understand how privilege and oppression are perpetuated. Our conversations led her to ask questions about why there was a lack of diversity in the market today. I believe that by identifying herself "as a librarian" she was indicating that librarians have an obligation to consider these questions.

When I met with Karen, I presented my findings by talking through the photos and other data examples in my two findings chapters. I told her that I wanted to share my findings to make sure she was comfortable with them since she and her children were primary participants in the study. When I presented the data about evidence of cultural bias, I reminded her that this reflected the print and materials I made available in my own home. I shared the story about my response to Aiden trying to open the paper doll application and then discussed the criteria I used to determine the categories for my analysis of my print and digital materials. I had my iPad with me and showed her the

book cover depicting two African American boys and how, when the book was selected, the title page actually depicted two White children. She asked me, "I wonder why they did that?" I told her I asked myself the same question.

This led to a discussion about Dora and Doc McStuffins, characters much loved by the children and intended to represent Latino and African American characters. I introduced the idea that their images were actually distorted, caricatured. We both agreed that the media was partly responsible for perpetuating negative images about different cultures. I went on to share how I demonstrated bias when I visualized the voice of a White person when listening to the eBook, *Llama, llama Red Pajama* even though the characters are animals. Karen demonstrated that this conversation pushed her to think more deeply about producers of media and their role in messages sent by the images used in eBooks and even the voices used within cartoons when she said, "It makes me wonder if the person who does the voice of Doc McStuffins is Black." Later the same day Karen texted me a link to the cast of the cartoon and confirmed that the person who does Doc McStuffin's voice was an African American.

Karen and I also discussed the ways that some applications appeared to be attempts at cultural neutrality. She said that she had noticed that some of the people in Aiden's racing applications wear racing suits and you "can't tell what color they are." She went on to say that, characters probably intended or assumed to be "neutral" actually were not. She illustrated this by telling about one of Aiden's applications: "He has a surfer app and the little boy on the surf board is White." She then said, "This makes me want to go home and look at what I have downloaded on Aiden's Kindle." Karen wondered aloud if she should look at the content on the iPad since that was what Aiden

and Madilyn had access to during the study. I told her that looking at Aiden's Kindle might be just as informative. The conversation left us both with a great deal to think about, and it demonstrated (particularly to me) that the first step to awareness of these issues is to have the conversation.

My Learning: Exposing, Challenging, Expanding

When I first began exploring the field of technology in early childhood education, I remember viewing a television commercial aired by a local Internet provider in which a young girl was sitting on her bed beside her father and they were both peering into an open laptop while visions of a giant octopus was projected on the walls around the room. The commentator ended the scene with the one-liner, "Let it in." The message I took away from this commercial was that the world is at our fingertips through technology; we needed only to open our minds and let it all in and it would change the world for our children. The commercial alluded to the importance of the bedtime story and seemed to acknowledge the importance of a having an expert present to help mediate the content *let in* by this father and daughter.

If only it were that easy; if only information equaled knowledge and knowledge equaled equity. I found myself wondering if technology could indeed change anything, or were we *letting it in* without question? I did not enter into this study thinking that technology was going to be the great equalizer if only everyone had access and could let it in, but I did enter the study wondering just how the literacy development of my three grandchildren might be influenced by technology. In the process, I learned about and challenged by own biases as I learned alongside the other adults in the study. In the process of conducting this research, I (a) expanded my definition of technology and

recognized the way that technology mediates learning, (b) recognized my pro print-based bias, and (c) recognized the cultural bias within the materials I had chosen.

Coming to terms with technology. While I cannot imagine living and working in a world without modern technologies, I am a digital immigrant (Prensky, 2001). This impacted how I viewed the children's interactions throughout the study as it challenged my constructs about what literacy is, the ways technology impacts my own literacy learning, and my views about the importance of print versus digital experiences in children's literacy learning. Throughout the study, I often returned to the literature to answer new questions or clarify new ways of thinking. This was certainly true as I explored ways that technology had evolved and influenced communication practices in society and mediated learning. I realized that, much like the parents in this study, I viewed current technology as an extension of my literacies rather than integral to them. Technology afforded me efficient ways to work and communicate in the world, but I viewed them as *add ons* rather than essential tools of literacy development.

Additionally, even though I was well aware of transactional theory (Rosenblatt, 1994), I had never really considered how mediated communication worked throughout my lifetime to influence and even formulate my belief system - how every book I read, every movie I watched, every newscast I listened to, every application I utilized worked to either change me or affirm my constructs about the world. I came to realize that, as I engaged with texts (whether a book, a billboard, or an application) I either accepted them as truths or pushed against them when I experienced dissonance (Rushcoff, 2013). I came to recognize that this was the nature of mediated learning in the 21st century.

I realized, perhaps for the first time, that even in my own interactions with the world I was not the primary mediator; the media through which I learned about the world worked to mediate it for me. As I read beyond my current constructs about mediated learning, I realized the semantics at work within the word *mediation* and the term *media*. Bolter & Grusin (2000) led me to think beyond this to consider the way media is re-mediated through continued changes in tools and communication practices.

I learned about how media continues to remediate continually reinventing and replacing old technology with newer technology (Bolter & Grusin, 2000; Fang, 2008). I realized I did not really view books, pencils, or paper as technology, even though I knew them to be so. These materials were so much a part of my own literacy that the awareness of the technology behind the tools had disappeared for me as I experienced what Bolter & Grusin (2000) termed "transparent immediacy" (p. 22). In my mind, technology had a plug or a battery. This realization brought an awareness of my pro-print bias. Ironically, drawing on research from the era in which I was born (Innis, 1952; McLuhan, 1966, 2010) helped me see how blind I had been to the subtle changes that had taken place within my own lifetime as the world shifted from a print-based to a digital-based society.

Pro-print biases. While I thought myself to be forward thinking about 21st century literacies, this study helped me recognize that I held biases that privileged print materials. These biases were grounded in my literacy history as well as my feelings about digital materials in the lives of young children. Throughout the study, I found myself caught between my fascination with technology and my fears about its omnipresence in the daily lives of my young grandchildren. As the grandparent and researcher, I felt a

sense of responsibility not only to honor the balance the parents sought, but also to question my own constructs about print and digital tools.

The pro-print biases that I uncovered in myself are best exemplified by my feelings about print materials in the public library. At the onset of the study, I anticipated spending hours sitting side-by-side in the library with the children reading and exploring books, much as I had with my own children years before. This vision of how my grandchildren would enter into the world of books through our engagements in the public library was captured in a photograph of Madilyn as she entered the children's section at our public library (Figure 5.4). The sign to her left read, "Dream Big, READ!"

As I write these words, I recognize that my decision to even take this photograph demonstrated my pro-print bias as well as my nostalgic view of reading with my own children. Additionally, I expected the children to engage with print-based texts as I had as a child (sitting on my mother's lap as she read aloud) and as my own children had as I read aloud to them. However, my nostalgic vision of reading experiences was not realized through our visits to the public library. As discussed in Chapter Four, the children had other engagements in mind, engagements with the literacy computer.

Figure 5.4. Madilyn's first data collection visit with me to the children's section of the public library

My pro-print bias was also revealed through another incident at the public library. Early in the study, I asked Jenny and Karen to get library cards for the children since I planned on using the library as a regular data collection site. I wanted the children to be able to self-select books each week to read with me or to take home to read with their parents. I happened to be with Jenny the day that she got Makayla's library card. I saw this as a rite of passage and integral to her membership in the literacy club (Smith, 1988), and I wanted to capture it in a photograph. I waited with Makayla outside the library as Jenny completed the application process. When Jenny emerged from the library, she handed Makayla her library card along with a DVD that she checked out for her to take home (Figure 5.5).

Figure 5.5. Makayla as she got her first library card and received the first material checked out for her–a DVD, not a book

I was both shocked and intrigued by Jenny's choice of material for Makayla. I had expected her to check out books; however, Jenny had selected a material in which she knew that Makayla would be interested, and with which she would be willing to engage. Although I was well aware that *text* meant much more than books, I still (perhaps subconsciously and nostalgically) limited the texts with which I expected the

children to engage while at the library, to children's books. I was aware that the library had audio and DVDs and eBook holdings available for adults and children (although our local branch did not have eBooks at the time of the study). However, this experience challenged both my expectations and my motives for selecting the library as a research site. I had to come to terms with the realization that libraries in the 21st century provided a variety of materials with which children may engage beyond those bound within the covers of a book.

Once again, my decision to take a photograph to capture the moment when Makayla received her first library card demonstrated my desire to chronicle what I viewed as a literacy milestone. In my mind, a library card was the key to open access to knowledge. I realized that I viewed the possession of a library card as the key to providing open access to information through print-based texts, just as it had for me and my own children.

This event caused my constructs about print texts to collide with the digital world in which I lived. It proved to be a pivotal experience because it caused me to question my own views about print and digital materials in the lives of the children. It also made me recognize my print-based blinder that led to a rather romanticized view of print-based texts that kept me from seeing the possibilities for other text expertise in the lives of my grandchildren.

Cultural bias. As discussed previously, the analysis of the many materials that I selected for the children's use in my home revealed a lack of cultural diversity, but more importantly, it revealed that I had been oblivious to the presence of bias in my selection of materials. This led me to do the online search that is reported in Chapter Four. As I

searched, I came across a site that provided recorded readings of familiar children's books. I recognized one title I had used many times with students and teachers, *No Mirrors in My Nana's House* (Barnwell, 1998). As I listened to the words and considered the meaning of this book, I realized there were many mirrors in this nana's house, print and digital materials that provided many mirrors in which my grandchildren saw their own reflection. I knew from other research that this teaches children that who they are and people who look like them matter and, conversely, that others do not. I was, in actuality, perpetuating White privilege and the unspoken belief in White superiority (Miller, 2012).

As discussed previously, the final member checks with my daughter and daughter-in-law were not easy conversations for me to have and caused me quite a bit of anxiety. I believe that my anxiety speaks to the many assumptions that continue to perpetuate stereotyping and bias in print and digital media, driving *The Market* (Myers 2014) in production choices and also driving the choices that families and educators make. The fact is, I was afraid to have these conversations about bias with my own daughter and daughter-in-law and this leads me to believe that it is the very fear of these conversations that keeps us from recognizing bias and figuring out ways to change this status quo. As a literacy leader in my own school district, as a teacher of children of color, and as someone who claimed to understand culturally relevant pedagogy, I had failed to apply my theory about racial, ethnic, and gender bias to my personal life. Additionally, I had failed to apply what I knew to be true about the importance of materials in the social construction of identity when it came to providing materials for my own grandchildren.

A final reflection on my learning. Humankind has attempted to map our cultural existence since time began through tools such as maps and narrative story (Rogoff, 2003). We have not always gotten the maps or stories right, but as a global society (McLuhan, 1966); we continue to write into it as our reflections help us learn from the past. In the process, we remap, rewrite, and remediate (Bolter & Grusin, 2000) what constitutes knowledge. In his story shared in the opening scenario, Aiden told me that pirates used maps because they did not have GPS. In this way, we use the tools at hand to make sense of the world. Throughout this five-month study, I observed how the children used the digital and print tools to make sense of and interact within the worlds in which they lived. As their grandmother and as a researcher, I shared in their journey and attempted to navigate relatively uncharted waters of 21st century literacies. Just as Gee (2011) posited, navigating those waters was not without pitfalls and perils. Beers (2010) alluded to these difficulties in her NCTE presidential address when she stated:

> We . . . may be venturing now into unknown waters—a world in which the tools of literacy are multiplying and evolving more rapidly than ever before, in which the social fabric is complicated by social networking tools, and in which our sources of information and *mis*information have exploded from three channels to …Some fundamentals remain true. But there will be dragons. (p. 341)

In many ways, conducting this study was a way of facing my dragons: fears and concerns I had about the way technology influences the literacy lives of children. These concerns were grounded in prior observations I made as a parent, grandparent, and educator. As a literacy coach, I noticed that many teachers struggled to make sense of these new digital tools of the culture and searched for ways in which to integrate technology in their teaching lives. Likewise, through working with parents in the school in which I work and through conversations and observations of my own adult children

and step-children, I recognized that parents needed to find their way through these waters as well.

As a result, I began this journey to see what I could learn about the literacy practices of three preschoolers as they used print and digital materials in home and community settings. Throughout the study, and now in the writing of these findings, my understanding about literacy learning and the importance of materials have been exposed and expanded. I realized that by remaining oblivious to the lack of diversity in the materials I made available, I perpetuated cultural bias. Additionally, as I faced my biases about print materials, I saw digital materials with new eyes. The recognition of my pro-print bias demanded that I view both print and digital materials as technologies. My findings about the active, agentive ways that the children learned about and through digital materials led me to view those materials, in addition to print texts, as integral and essential in 21st century literacy development.

Conclusion to Chapter Five

In this chapter, I have explored the learning experienced by the adults in the study. While the focus of the study was on the ways the children used print and digital materials, the learning experienced by adults as a result of the children's engagements with these materials were influential in the overall findings. Throughout the study, the adults, particularly the mothers of the children, seemed to be caught in the flux between current changes in communication practices and the demands of rearing children in an age of instant everything. This might have led the parents to view digital materials differently than the familiar print-based materials they used when they were in school.

Although the adults in the study had become active producers and consumers of digital technology, we seemed to be caught between old and new media.

Findings presented in this chapter also illuminated ways that adults worked to balance the children's digital and print use demonstrating that we held the keys that either *locked* or *unlocked* the potential for children's engagements with print and digital materials. Critically, we hold the keys to our children's exposure to diversity in ways that introduce and perpetuate stereotype and bias, or in ways that do not communicate the superiority, distortion or negative stereotype of any race, ethnicity or gender. Additionally, this study provided opportunities for the adults in the study to expand their understandings, coming to view literacy as much more than just reading and writing printed texts and *texts* as much more than just children's books.

An important conclusion that I drew from these findings is that materials do indeed matter. Materials matter because they have the potential to provide children with opportunities for learning through purposeful interactions in social settings. Materials matter because, when children have the opportunity to engage with the tools of their culture, they develop skills and strategies that allow them to communicate and participate in today's world. This includes both print and digital materials. Of particular importance is the disposition of the adults about print and digital materials in children's lives. The only hope of interrupting current narratives that perpetuate the dominance and privileging of one race or cultural group or that foster negative or limiting racial, ethnic, and gender stereotypes through print and digital media is to challenge and change what Myers (2014) referred to as *The Market* and to make access decisions accordingly. Parents, grandparents, childcare providers, teachers, administrators, and librarians *are* the

market, and we all have a role to play in the narratives being written in the lives of young children as we select and provide access to the print and digital materials in their worlds.

These findings lead me to suggest implications for families, caregivers, and educators as well as to illuminate the need for further research in the field of print and digital literacies in early childhood education. Findings articulated in Chapters Four and Five will guide my discussion of implications in Chapter Six, serving as a call to action for those engaged in the lives of young children. As family members, caregivers, and educators, it is our responsibility to provide young children with the kinds of literacy experiences that will allow them to write more just literacy narratives as members of the 21st century literacy club.

CHAPTER SIX

IMPLICATIONS

This study was designed to examine the literacy practices of three preschool children as they used print and digital materials in home and community settings. I chose to conduct this research to gain insights about ways that young children develop literacy skills within a highly technological world. I focused on my three grandchildren because of access that I had to their transactions in ways that other researchers would not and in the spirit of other rigorously researched family studies (Long & Long, 2014; Martens, 1996; Miller, 2012). Grounded in a theoretical framework that acknowledges literacy learning as socially constructed and influenced by the individuals, materials, and modes of communication within the life of the learner, data were collected as Aiden, Madilyn, and Makayla, engaged with print and digital materials in their worlds. The analysis of videos, photographs, field notes, surveys, and interview transcripts led me to findings about the ways that print and digital materials were used and viewed in the lives of the children over a five-month period of time. These findings led to the implications discussed in this chapter.

Implications from my findings are far reaching in that they might inform all individuals who care for or teach children, but especially those children in the early childhood years, from birth to age seven. Thus, I offer suggestions from this study for families, caregivers and, educators. I chose not to separate implications based on the intended audience because all of these individuals make decisions about the purchase of,

access to, and engagement with print and digital materials in the lives of the children for whom they care or teach. Additionally, I feel that children will ultimately benefit as families, caregivers, and educators consider the suggestions that follow.

In this chapter, when I refer to families, I include many individuals in the role of primary caretaker of young children including birth parents, step-parents, foster parents, grandparents, and guardians, as well as aunts and uncles or other extended family. Caregivers include those who care for children in the absence of the parent: babysitters, daycare workers, or other childcare providers. Educators include those who are in a position to purchase, provide access to, or facilitate engagements with print and digital materials in formal school settings and include teachers, teacher assistants, teacher educators, media specialists, interventionists, literacy coaches, technology coaches, professional development providers, and administrators. Implications also extend to media specialists in the public sector as well as the producers of print and digital materials for young children and the consumers who purchase these products.

My findings suggest that adults in the lives of children make important decisions as they select, purchase, and provide access to, and engagements with, print and digital materials. Therefore, implications (Table 6.1) are organized as they relate to (a) the way adults view and value print and digital materials (b) recognizing and responding to bias in print and digital materials made available to the children, (c) ways children transact, transmediate, and transfer within and across print and digital materials, and (d) providing opportunities for children to be active, agentive users of print and digital materials. Further implications are offered for researchers in the form of (e) methodological insights, and (f) suggestions for further research.

Table 6.1.

Implications for Families, Caregivers, and Educators

Findings		Implications for Families, Caregivers, and Educators
Findings that lead to implications for the ways adults viewed, valued, and used print and digital materials.	o The adults valued both print and digital materials and engagements, but held pro print biases in terms of school-style literacy. o The children emulated the uses of print and digital materials. o The adults viewed some digital engagements as real learning and some as digital play, but expanded their understandings as they recognized the children learned a wide range of skills as they engaged with print and digital materials. o Adults expanded their understanding of literacy learning and *texts* in the world.	o Become Cognizant of Personal Biases about Print Versus Digital Materials. o Recognize that children learn from adult models the uses of print and digital materials and how to do so in ways that will provide access to both. o Recognize that children read and make meaning through accessing and engaging in a variety of *texts* in the world. o Recognize that the wide range of real learning takes place through engagements with both print and digital materials so that one is not privileged over the other as school-style literacy.
Findings that lead to implications about recognizing and responding to bias and stereotyping in print and digital materials.	o The children accepted and used both print and digital materials as a part of their worlds. o Adults controlled the children's access to, and content of, print and digital materials which had the potential to limit or expand sociocultural awareness.	o Learn to recognize bias and stereotyping in digital and print materials and provide access to materials accordingly. o Critically examine the print and digital content for evidence of bias and stereotyping. o Become aware of recent research and position statement about materials o Take action in regards to culturally relevant and non-gender biased materials.

Table 6.1. (Continued)

Implications for Families, Caregivers, and Educators

Findings		**Implications for Families, Caregivers, and Educators**
Finding that lead to implications about how the children transacted, transmediated, and transferred skills within and across print and digital materials.	o Transactions with print materials were different than transactions with digital materials. o The children engaged in more conversations and demonstrated greater emotion during print engagements and often chose not to engage in conversations with others while engaged in digital engagements. o The children transmediated and transferred skills across print and digital materials	o Provide children with a balance of both print and digital based literacy experiences and recognize the intrinsic and extrinsic rewards of both mediums. o Recognize that print based texts have the potential to be accessed in non linear ways and offer layers of engagements much like digital texts. o Recognize and provide opportunities for children to talk about the print and digital materials with which they engage. o Provide opportunities for children to explore, experiment, and engage with both print and digital material.
Findings that lead to implications about children as active, agentive learners	o The children shared the role of expert and apprentice within print and digital environments. o The children exhibited a greater sense of agency, empowerment, and confidence with digital materials than they did with print materials.	o Recognize children's expertise in taking on the roles of expert and apprentice in print and digital environments o Provide opportunities for children to be empowered within the use of print and digital materials as they share the role of expert and apprentice.
Methodological Implications • Engage in self-reflection about assumptions and bias throughout the study. • Recognize the challenges and rewards of grandparent studies. • Examine the pros and cons of electronic qualitative research software.		

Table 6.1. (Continued)

Implications for Families, Caregivers, and Educators

Implications for Further Research

- Studies of young children learning digital and print literacies in settings other than the one in this study.
- Examine the ways children transact with the print version of texts vs. the electronic versions of the same texts.
- Studies that examine young children's use of print and digital tools in schools.
- Critical ethnographies surrounding the selection and uses of print and digital material in early childhood settings.
- Critically examine the digital application market for evidence of cultural or gender bias.

Viewing and Valuing Both Print and Digital Expertise

A key finding in this study was that the ways adults viewed, valued, and used print and digital materials in their own lives influenced the way the children emulated the uses of those materials. The adults (including me) held pro-print biases and viewed some digital engagements as real learning and others as play while also challenging their original biases and expanding their notions about texts through the course of the study. The findings lead me to suggest that it is important for adults to (a) be cognizant of personal biases about print versus digital materials and adjust children's access accordingly, (b) recognize that adults provide models that children emulate, (c) recognize that children read and make meaning by accessing and engaging in a variety of *texts* in the world, and (d) recognize that real learning takes place when children are engaged with both print and digital materials.

Become Cognizant of Personal Biases about Print Versus Digital Materials

Findings in this study illuminated the way that print materials were often privileged over digital materials in the children's lives. While active producers and consumers of digital materials, the adults (including me) did not view digital materials in the same way as we viewed print based materials. This was in spite of the fact that we enjoyed reading for our own pleasure on digital devices. We held nostalgic views of books and print materials and valued reading in print materials over digital materials for use in literacy development. These findings lead me to suggest that adults need to be aware of biases they may hold in regards to print and digital materials. The mere presence of digital tools in our lives was not enough for us to recognize and face our own biases. However, the study's data and member checking interviews reveal and discuss what had been concealed. Thus, the first step in overcoming our biases was to become aware of them or as Johnston (2004) posited, noticing and naming them.

Engage in self-reflection. Often self reflection through posing questioning is one way to begin recognizing biases and beginning to consider alternative views. Reflecting on the following questions could lead adults to a deeper understanding of the ways they view both print and digital tools:

- Do I prefer print materials over digital materials for my own personal use?
- Do I think print books are more important to school success than digital materials? If so, why?
- Do I think print materials are more accurate than content found on the Internet? If so, why?
- Do I think digital applications are just for entertainment? Why?

- Do I think children can learn from playing digital games? If so, what kinds of skills and strategies might they learn?
- Observe a child or children every day for a week as they engage with digital texts and then ask: What expertise do I notice? What skills did the child/children use as they engaged with digital materials?

These questions could lead families, caregivers, and educators to understand the ways that they may privilege either print or digital materials in their own lives and consequently in the lives of their children. That is not to say that we do not have preferences (I personally prefer reading at night on my iPad because I do not have to turn on the light), but when our beliefs are so strong that they limit the possibilities for children to engage with materials within their culture, this could potentially impact literacy development.

Recognize and address pro-print bias. My findings led me to believe that facing biases with regard to privileging print over digital materials and engagements allowed me to see the potential for the children's literacy growth through their uses of both print and digital materials. Additionally, facing my own biases led me to see beyond the limitations of my own literacy history in order to consider the ways in which materials matter in the literacy lives of young children. Some actions that might lead others to greater awareness of personal bias about print and digital materials include:

- Share your literacy past with your children and compare your own childhood experiences with that of your children.
- Make lists of pros and cons concerning print and digital materials.

- Plan a digital day in which you and your family or the children in your care only communicate digitally.
- Plan a print day in which you only engage in print materials.
- Following the print and digital days, discuss how print and digital materials helped you communicate in some ways and how these tools interrupted communications in other ways.

Recognize that Adults Provide Models that Children Emulate

During this study I found that the children emulated the adult uses of print and digital materials in home and community settings. The adults in the study were often seen checking email, searching the Internet, or sending and receiving texts on their smart phones during family meals; therefore, the children also asked to use digital tools during meal time. These engagements were often void of conversation, a preoccupation that at times led to tensions within the families in spite of the fact that, in many ways, the children were emulating the ways the adults in their world engaged with digital devices.

Today it is increasingly difficult to have any human interaction that does not also involve technology. Face-to-face communication has been replaced, in many instances, by Skype, texting, and instant messaging. As children emulate the adult uses of digital devices, it is important for adults to remain cognizant of the models provided. This leads me to suggest ways that adults and children might engage with these devices to lead to greater interpersonal communication and fewer confrontations or tensions within digital spaces. These implications suggest that families examine the ways that they model the use of digital devices as they help young children develop as socially responsible digital consumers. Reflecting on personal uses of digital materials might provide adults with

insights into the models they provide children so that young children develop desired behaviors within digital environments:

- Consider and discuss expectations of family members as the engage with digital devices.
- Model expected digital behavior based on family expectations.
- Take note of how often you check phone messages, status updates, or text messages throughout the day.
- Keep a log for one day to examine your own or your family's use of digital tools for communication and entertainment.

Recognize that Children Make Meaning Using a Variety of *Texts* and *Literacies*

Findings from this study demonstrate that the adults came to see literacy as more than reading books and writing print texts and they came to define *texts* as much more than just print books. Their expanded definition of *text* encompasses the many kinds of materials with which learners can potentially engage. These materials might include print books, digitalized books, signs, artwork, music, websites, podcasts, blogs, tweets, videos, television programs, and digital applications. This list will continue to expand as new technologies are developed.

While expanded definitions of *text* and *literacy* have been clear in the field of literacy education for decades (Coiro et al., 2008; Gee, 2011; Street, 2003), such views were not internalized by adults in this study. They viewed print texts with a kind of nostalgia that kept them from seeing the legitimacy of other texts and learning from those texts as literacies in their children's learning lives. Thus, leading individuals to a deeper and expanded understanding of texts and literacy could be an important first step in

understanding that the learning environments of young children today extend beyond books, paper, and pencil.

Expanded definitions also include communication and collaboration skills, often called soft skills, required to communicate in a global society. Several professional organizations have embraced this expanded definition to involve reading, writing, listening, speaking and viewing in the world (NCTE, 2009; NBPTS, 2011) and have expanded it to encompass 21st century literacies (NCTE 2009; The Partnership for 21st Century Literacies). There are a variety of resources available in print and digital formats to better help individuals understand what it meant by 21st century literacy and expanded definitions of *text* (Table 6.2).

Table 6.2.

Resources for Expanding Understanding of 21st Century Literacy

Print-based Texts:

- *Supporting Students in a Time of Core Standards: English Language Arts K-2* (Long, et al, 2011) In addition to provide key insights about teaching in the 21st century and provides a wealth of resources for educators that might also be beneficial to parents and caregivers.

Internet Resources:

- "Standards for the 21st Century Learner" by the American Library Association: http://www.ala.org/aasl/standards-guidelines/learning-standards
- Edutopia is a site funded by the George Lucas Foundation : http://www.edutopia.org/
- "New Literacies and 21st Century Literacies" published by the International Reading Association: http://www.reading.org/Libraries/position-statements-and-resolutions/ps1067_NewLiteracies21stCentury.pdf

Table 6.2. (Continued)

Resources for Expanding Understanding of 21st Century Literacy

- The Connected Community-a forum supported by The National Council of Teachers of English explores a variety of topics including 21st century literacy: http://ncte.connectedcommunity.org/home
- "A Framework for 21st Century Curriculum and Assessment" by The National Council of Teachers of English: http://www.ncte.org/positions/statements/21stcentframework
- The Partnership for 21st Century Literacy provides a framework and visual of 21st century literacy http://www.p21.org/storage/documents/1.__p21_framework_2-pager.pdf
- The Partnership for 21st Century Literacies provides a video that demonstrates that children today need more than the 3Rs to be successful: http://www.p21.org/our-work/resources/for-educators/1007

In addition to the resources offered in Table 6.3, I offer the following engagements to help families, caregivers, and educators extend understandings about *texts* and *literacy* to encompass a variety of print and digital materials. In many ways, embracing an expanded view of the term *text* is a matter of semantics. As individuals begin to use this term to refer to an expanded array of materials in print and digital environments, the expanded definition takes on new meaning for them. But for some people who hold deeply rooted beliefs about the term as referring to print material only (and more narrowly to print books), engagements such as the ones that follow might help them conceptualize an expanded understanding of the term as well as expanding their views about what constitutes literacy.

- Assess prior understanding**:** Begin by assessing prior understanding of the term *texts.* One way to do this is to ask the participant(s) to write a definition of *text* or the definition of the term *literacy* in 140 characters or less (as if

sending a tweet on *Twitter*). Provide a handout of the array containing 140 blocks (Figure 6.1).

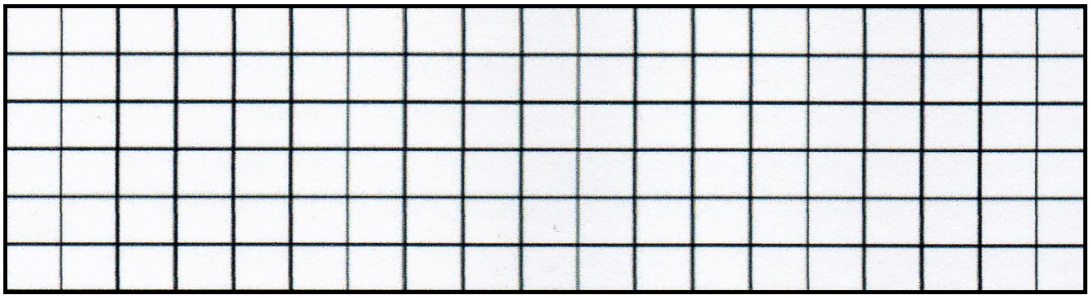

Figure 6.1. Twitter grid for defining the term *texts* or *literacy*

- Provide examples texts/literacy: Provide a display of a variety of examples of texts or literacy. Example of texts might include an email, a piece of artwork, a stop sign, an advertisement, sheet music, a textbook. Examples of literacies might include mathematical, musical, digital literacies beyond reading and writing in print formats. Discuss how each item either fits their definition or if it does not. Discuss how meaning is made within each of the items displayed.
- Co-construct expanded definitions: Discuss and co-construct a definition of the terms *text/literacy* on a chart or on a computer screen; display the co-constructed, expanded definition of the term text/literacy.
- Cube the terms *text/literacy*: Cubing is an engagement in which a person looks at a term or concept through multiple perspectives. The participant can begin this reflection by visualizing a cube. Each of the six sides that make up the cube represents a different way of thinking about a term: (1) describe it (look at it closely), (2) compare it (to what is it similar?), (3) associate it (of what does it make you think?), (4) analyze it (what are its attributes?), (5) apply it

(what can you do with it?), and (6) argue for it or against it. Share out responses.

- Twitter conversation-Texting about texts/literacy: An additional or alternative engagement could be to have individuals engage in a Twitter conversation about the expanded definition of texts or to participate in a written conversation using paper and pencil. One person begins by making a statement or asking a question about the definition and then the other person responds either electronically or in writing. This continues for a specified period of time as participants read responses and extend their own ideas through writing.

Recognize that *Real* Learning Takes Place Using Both Digital and Print Tools

As a result of this study, I learned that holding pro-print biases could lead adults to privilege print over digital engagements. At the beginning of the study, the adult participants felt that *real learning* took place primarily as the children engaged with print materials. The children, however, learned a wide-range of skills and strategies within both print and digital environments. These findings lead me to suggest implications for helping adults recognize the wide range of real learning that takes place within both print and digital environments while at the same time expanding their understanding of what it means to be literate in the 21st century.

Assess an expanded repertoire of literacy skills. Findings that demonstrate a wide range of learning that took place as the children engaged with print and digital materials lead to implications for formal and informal assessment in schools as well as implications for supporting family members in recognizing their children's expertise.

Although it is not typical for parents or caregivers to formally assess children's knowledge about print concepts or skills, it is perfectly natural and important for them to make observations about literacy growth and expertise such as noting when children begin to recognize letters or identify print in the environment such as names of restaurants and stores. It is however common practice for teachers to assess those literacy skills both formally and informally in schools through observations, checklists, and inventories. The implications in this section expand notions about formal and informal assessment to include digital literacies.

Based on my findings, it is apparent that the children in this study will begin school with a varying levels of digital proficiency learned in home and community settings. While much literature focuses on the importance of educators to recognizing and capitalizing on home literacies (Heath, 2012; Hull & Schultz, 2002), expanded definitions of literacy and text mean that educators and families must be cognizant of the impact that these skills have on a child's ability to succeed in school and society. While many early childhood educators integrate technology as options when selecting instructional materials, it is not common practice to recognize the many digital skills children bring to school when they begin kindergarten. Therefore there is a need for observation tools that early childhood childcare providers and educators might use to determine the skills and aptitudes young children bring with them as they enter school settings. While I do not want to communicate that we need more assessments in the lives of young children, I do believe that it is important for educators to recognize the expertise that many children bring to the classroom and areas for potential skill growth so that every child gains expertise on the digital playing field. To address this need, I developed two observation

tools that could be used by educators to determine the digital literacy skills that young children bring to school: *Concepts About Digital Literacies*.

Background to the development of Concepts About Digital Literacies. Much like the way that young children learn about print books through handling and engaging with them, findings from this study suggest that, as the children mastered the skills required to use digital devices (such as controlling the directionality of the text, selecting applications by tapping on icons, or turning pages by swiping the screen), they were better able to more fully engage with the applications. This led to opportunities for the children to learn additional literacy skills such as letter identification, phonemic awareness, and basic sight words as well as spatial orientation, and problem solving skills, as to learn additional digital skills as they manipulated digital devices.

This is important because it is not uncommon today to see a class of five-year-old kindergarteners sitting in front of computers, each child wearing headphones and manipulating a mouse in order to engage in literacy activities or take computerized assessments to measure early literacy skills. In the fall in which this study concluded, Aiden was administered several assessments in school through the use of a desktop computer requiring him to use a mouse to select answers on the test. In Aiden's case, he was not as proficient in the use of a mouse as he was in the use of touch screen devices. While Aiden had used a mouse on the literacy computer in the public library, he did not have access to a computer with a mouse in his home. This led me to consider developing observational tools that would help teachers recognize the digital skills that young children bring to the classroom and might help teachers plan instruction accordingly.

Concepts about Digital Literacies: Two tools. Owocki & Goodman (2002) refer to tools and strategies that teachers use to know their students and gain insights into their literacy development as "kidwatching" (p. x). With this in mind, I developed two observation tools, one to evaluate children's expertise with computers (Table 6.3) and the other evaluates children's skill with touch screen devices that are typically called tablets (Table 6.4). The observation tools might be used as one of many ways in which *kidwatchers* can better understand what their students know and can do.

These tools are not intended to identify deficits or imply that students who do not come equipped with these skills are lacking in some way. Teachers should carefully consider inequities that may arise in these observation tools depending on students' access to technological tools at home and look to other funds of knowledge that children bring to the classroom that will support their abilities as users of technology. When used as an additional means of gathering kidwatching data, these tools may help teachers as they plan for and provide experiences for children to be able to demonstrate their literacy knowledge through digital means and to engage in the use of digital tools for literacy engagements. These tools might also be used to identify the digital experts in classrooms as teachers validate the competencies many children bring with them to school.

Additionally, the tools might provide educators with a means of determining what kinds of engagements might be beneficial for children prior to administering computerized assessments so that these assessments are valid measures of literacy skills and not impeded by a child's inexperience with the technology. Due to the rapid advances in digital technology, the tools are not presented as a definitive list of competencies, but rather serve as one of many tools that educators in elementary schools

or childcare providers in preschools might use to better know their learners. Printable copies of the observation tools can be found in Appendix C & D.

Table 6.3.

Early Childhood Observation Tool of Digital Concepts of Computers

The student can:	Observations:
1. Manipulate the cursor with the mouse causing the cursor to move.	
2. Recognize that the movement of the mouse can be seen on the screen.	
3. Locate and select the ENTER key on the keyboard.	
4. Select applications, programs, or content using the left or right click of the mouse or touch pad.	
5. Demonstrate an understanding that digital content may be presented top down or left to right.	
6. Use the scroll feature on the mouse or keyboard to scroll down the page to access additional content.	
7. Select, drag, and drop content using the mouse.	
8. Use the mouse to select desired content (such as an answer or an icon to continue to an additional page.	
9. Deselect programs and return to the home screen by selecting the X in the top right corner of programs or applications.	
10. Correctly identify the keyboard, monitor, and mouse.	
Comments:	

Note: This observation tool is intended to help teachers recognize some of the many skills that children may bring to school and provide opportunities for teachers to validate this knowledge as evidence of *real learning* that children do in home and community settings as well as in schools.

Table 6.4.

The Early Childhood Observation Tool of Digital Concepts of Touch Screen Devices

The student can:	Observations:
1. Locate and engage the button to turn on the device.	
2. Swipe the main screen to open access to applications and enter pass code when required.	
3. Recognize that icons are used to select and gain access to applications.	
5. Self-select an icon to activate an Application.	
6. Recognize that there are levels of engagement (activities) within applications and can self-select using the touch screen.	
7. Rotate the device so that content is in landscape or portrait and move the device to control action and movement within applications when applicable.	
8. Turn pages and access content by swiping right to left or top to bottom.	
9. Select, drag & drop content within Applications.	
10. Navigate back to the home screen to select a different application or activity.	
Comments:	

Note: This observation tool is intended to help teachers recognize some of the many skills that children may bring to school and provide opportunities for teachers to validate this knowledge as evidence of *real learning* that children do in home and community settings as well as in schools.

Bias and Stereotypes in Digital and Print Materials

Throughout this study, I found that the children accepted and used materials in their home and community settings as part of their worlds. I also found that adults served as the gatekeepers of print and digital material. They made decisions about the kinds of print and digital material to which the children had access and how often and for how long the children were able to engage with digital materials. An important finding was that adults often made these decisions based on the children's favorite characters from television and movies and by choosing applications that reflected the children's racial and cultural worlds. In the process, the majority of the applications to which the children had access sent messages of the normalcy of whiteness, gender stereotypes, and often distorted and caricaturized depictions of ethnicities other than the children's own. This reality was unrecognized and unexamined by the children's parents and by me until late into the study as I was writing about findings and as we engaged in final member checking sessions.

When I found that the materials that I made available for my grandchildren did not reflect the diversity of the worlds in which the children lived and when they did reflect diversity, the images were often distorted or stereotypical, I was devastated. I prided myself on being culturally aware; I had even co-written an article about my own awakening to personal bias (Long et al, 2008) and my book collection at school was full of culturally diverse children's books. This realization leads me to suggest that many families, caregivers, and educators may also feel unbiased without recognizing biases that have become so normalized that they cannot be seen. Guidance is needed so that we can act as critical consumers of both print and digital materials by becoming more cognizant

of the impact of their decisions on either the interruption or perpetuation of racial and cultural stereotype and bias, and gender stereotype. To provide some guidance, I suggest ways that adults can (a) learn to recognize bias and stereotyping in materials, (b) critically examine content of print and digital materials, (c) become aware of recent research in the field and the position statements of professional organizations concerning bias in both print and digital materials, and (d) take action in the world with regard to culturally relevant and gender stereotyped materials.

Learn to Recognize Bias and Stereotyping in Print and Digital Materials

Today, more than ever before, children and adults are bombarded with images in a variety of media forms. These images send messages that often go unnoticed by consumers and have the potential to perpetuate or interrupt social inequities and bias. As I looked closely at the digital content that I had on my personal iPad as well as examining the children's books in my own home setting, I became aware of the subtle and direct ways that images and the omission of images can send messages about the correct way to be in the world. In doing so, I became aware that many of the materials that I had provided the children represented dominant cultural bias. However, had I not noticed that these biases were present, I would have continued, unaware of the messages being sent to the children about the world and their role in it.

Recognizing bias within ourselves. As I discovered when I faced my own biases as an educator (Long, et al., 2008), facing personal bias is difficult. Change often flies in the face of long-standing belief systems that have become as much a part of us as the nose on our faces. However, one must confront biases before real change can take place. Even though I had attempted to face my biases years ago, I learned that there was still a

disconnect between what I thought I believed and what I actually did. Findings suggest that as I faced the reality that I still held Eurocentric views and that this had (albeit unknowingly) influenced my choices of materials, I was better able to see evidence of bias within the materials I had chosen for my grandchildren. The implication of this finding is for families, caregivers, and educators to examine their own beliefs concerning dominant culture and gender bias as they select, purchase, and engage children in a variety of print and digital materials. Suggestions for engaging in this self reflection include:

- Make a list of what you believe about races or genders including your own.
- Examine your list for evidence of bias (examples of this include assumptions about intellect, ability, worthiness, or that group individuals in a way that assigns certain attributes to only those individuals).
- Step outside your cultural comfort zone by visiting the homes or community gathering places of different races or ethnic groups. It is important to go with the intent of building relationships and recognizing strengths rather than viewing differences in beliefs or cultural practices as deficits.
- Examine photographs that represent cultural or gender bias and engage in conversations around how and why the images represent bias.
- Read and engage in book discussions with colleagues, other parents, friends to explore this topic (suggested readings: Table 6.5).
- Register for anti-racist workshops that will help you explore and examine bias at individual and institutional levels.

- Take courses focused in equity, racism, gender bias, sociocultural and critical theories, and culturally relevant pedagogies.

Table 6.5.

Resources to Explore Race, Culture, and Gender Bias

- *Can We Talk About Race: And Other Conversations in an Era of School Reform* (Tatum, 2007)
- *Deconstructing Early Childhood Education* (Canella, 1997)
- *Diversities in Early Childhood Education* (Genishi & Goodwin, 2008)
- *Growing up Literate: Learning from Inner-City Families* (Taylor & Dorsey0Gaines, 1988)
- *"Multiplication is for White People": Raising Expectations for Other People's Children* (Delpit, 2012)
- *Negotiating Critical Literacies* (Vasquez, 2014)
- *Still Failing at Fairness* (Sadker & Zittleman, 2009)
- *Tensions & Triumphs in the Early Years of Teaching: Real World Findings and Advice for Supporting New Teachers* (Long, et al., 2006)

Critically Examine Content of Print and Digital Materials for Bias

Findings suggest that I did not become fully aware of the lack of diversity within the print and digital materials I made available for the children's use until I critically examined them. For me, a first step in providing more culturally relevant materials was to take a closer look at those materials and engage in self-reflection as I considered the inclusion or omission or stereotyping of cultural and racial diversity. Therefore, one suggestion for becoming more aware of bias within print and digital materials is to begin to notice the kinds of images that are provided in materials and then acting on the insights gleaned from the process. Just as I used an inventory of the applications that I had on my iPad to consider diversity within my own applications, family members, caregivers, and

educators might engage in a similar reflection as they consider the print and digital materials they provide the children in their lives.

An inventory of print materials. As a means of further analysis, an inventory of print materials was conducted following the data collection period to determine the inclusion of bias as well as the exclusion of diverse print materials to which the children had access in my home. As described previously, I sorted the books into stacks based on four categories and then counted the total and determined the percentage in each category of my collection. This inventory revealed that my own personal book collection did not represent diversity and in fact reflected racial bias and gender stereotyping. I suggest the use of this inventory chart as a tool for other adults to use in conducting as self assessment of print materials in home, community, or school settings (Table 6.6).

Table 6.6.

Personal Inventory of Bias in Print Materials

Description of categories for analysis	Number of Children's Books and Magazines	Number of Books and Magazines Dominated by European Americans (White people)	Number of Books and Magazines With One or More Persons Of Color	Number of Stereotypical or Distorted Representations of Persons of Color	Number of Applications Using Animals or Non-human Characters
Frequency					
Percentage					

An inventory of digital content. Taking inventory of personal digital content is also an important first step in developing an awareness of the presence of bias or stereotyping within personal electronic books and applications. To conduct this

inventory, I suggest a frequency chart done with tallies rather than the more extensive listing of applications discussed in the findings. As I considered the evidence of cultural bias within digital content, I used the same categories. It is important to note that while digital content included persons of color, at times these images were stereotypical or distorted. This chart in an expanded form to accommodate the tally marks and might be a helpful tool for a self-assessment of the digital applications and eBook that reflect dominant culture or diversity (Table 6.7).

Table 6.7.

Personal Inventory of Bias in Digital Materials

Basis for analysis	Number of Applications and eBooks downloaded for the children on My iPad	Number of Application or eBooks that Reflected only White people	Number of Applications or eBooks that Reflected One or More Persons Of Color	Number of Negatively Stereotypical or Distorted Representations of Persons of Color	Number of Applications With Only Animals or Race was Not Physically Visible
Frequency					
Percentage					

Other tools for examining print and digital materials for bias. There are tools available online to provide additional support for checking materials for evidence of bias. A list of guiding questions to use when checking materials for evidence of bias can be found at: http://media.doe.in.gov/diversity/docs/checking_instructional_materials_for_bias.pdf. Another instrument is the "Bias Evaluation Tool" developed in 2001 by the Nova Scotia Department of Education and is available at: ftp://ftp.ednet.ns.ca/pub/educ/studentsvcs/bias_evaluation/bias_eval_ss.pdf

Going deeper: Asking questions of the materials. The inventories that I did of the print and digital materials led me to ask many questions of the materials and of myself as a consumer of those materials. As others examine the print and digital materials to which they provide young children access, the following questions and considerations could lead to additional insights:

- In print and digital materials that utilize animals or non-human characters, what do you and the children in your care assume about their race, ethnicity, or gender? Dig deeper by considering what assumptions led you and the children to those conclusions.
- In digital materials, in which voices speak for the characters, are there stereotypes reflected? What are they? What makes them stereotypes? What could be altered to make them more authentic? As you listen to the voices, do you assign gender, race or ethnicity to the characters? Why?
- In digital and print materials, that attempt to reflect diverse communities, examine the characters. Do they represent and perpetuate stereotypes? How? Are they distorted or caricaturized? If so, why is this a problem? What messages does it send?
- Compare the actions in digital and print texts of persons of color and European Americans; of boys and girls/men and women. What do you notice about their roles? Their abilities? Their interactions with each other?

Examine Recent Research and Professional Organization Position Statements

My findings led me to examine not only the content of my personal print and digital materials, but to read beyond my current constructs about ways personal beliefs

are shaped, often hidden, and guide our selection of, and engagements with, materials in the literacy lives of children. This led me to reexamine recent studies in the field concerning cultural relevancy as well as the position statements of professional organizations. As I read, I also corresponded with my dissertation advisor and met with adult participants in the study to reflect together about key issues. As a result, I was reminded about the power of social interaction in the process of self-reflection.

This leads to my suggestion that families, caregivers and educators read beyond their personal current constructs and engage with each other as they push themselves to new understandings. Suggested readings as foundational to further learning include:

- Current research in the area of cultural relevance and bias and the education of young children. The following researchers provided me with additional lenses through which to view my findings and are offered as resources that might lead others to learn more about cultural relevance.

    - In 2012, Erin Miller conducted a study of her three children and the ways their concept of race was socially constructed (Miller, 2012). Her work informed my analysis and subsequently the findings within this study.

    - In 2012 Kela Goodman conducted a study within a school setting that focused on equitable assessment practices (Goodman, 2012). As I considered the implications of her study, I reflected on the need for equitable assessments of literacy skills through the use of computerized testing in schools today.

    - An additional study conducted in 2012 by Sabina Mosso-Taylor examined the ways in which teachers view children who fall outside the parameters of narrowly defined norms within our society as she chronicled her journey as an administrator to lead teachers to face assumption and embrace more equitable practices.

- Position statements from national professional organizations also provide a way for individuals to read beyond their own current understandings. For example:
    - The American Library Association white paper: "The Importance of Diversity in Library Programs and Material Collections for Children" by Jamie Naidoo. Access at http://www.ala.org/alsc/sites/ala.org
    - The National Council of Teachers of English Position Statements. Access at on Diversity at: http://www.ncte.org/positions/diversity
    - NCTE Statement on Multimodal Literacy and Technology. Access at http://www.ncte.org/governance/MultimodalLiteracies
    - The NAEYC Position Statement on Technology and Interactive Media as Tools in Early Childhood Programs Serving Children from Birth through Age 8. Access at http://www.naeyc.org/files/naeyc/file/positions/PS_technology_WEB2.pdf
- Articles and books
    - *Kinderculture: The Corporate Construction of Childhood* by Shirley Steinberg (2011).
    - *Free Within Ourselves: The Development of African American Children's Literature* by Rudine Sims Bishop (2007).
    - "Where are the People of Color in Children's Books" by Walter Dean Myer (2014). Access at http://www.nytimes.com/2014/03/16/opinion/sunday/where-are-the-people-of-color-in-childrens-books.html?_r=0
    - "The Apartheid in Children's Literature" by Christopher Myers (2014). Access at http://www.nytimes.com/2014/03/16/opinion/sunday/the-apartheid-of-childrens-literature.html
- Websites
    - The School Library Journal provides a list of culturally diverse books at: http://www.slj.com/2014/05/diversity/culturally-diverse-books-selected-by-sljs-review-editors#_

- "Mirrors, Window, and Sliding Glass Doors" by Rudine Sims Bishop: an article about the importance of multiculturalism in books. It is found on the Reading is Fundamental website at: http://www.rif.org/us/literacy-resources/multicultural/mirrors-windows-and-sliding-glass-doors.htm

Take Action With Regard to Culturally Relevant Materials

The implications about the lack of authentic diversity in the print and digital texts in my grandchildren's worlds are far reaching. It seems clear that, just as print materials do not always accurately represent our richly diverse world, digital materials have an even greater potential to open or close us to diverse perspectives and ways of being or to send messages about the supremacy of one race, cultural group, language or belief system. Today there are more than 900,000 applications available for digital devices (Costello, 2014). If my study is any indication, access to authentically diverse and non-stereotyped gender representations are difficult to find (or limited) in applications for young children. This leads to implications for families, caregivers, educators, and the market (both producers and consumers) as agents for change.

If there are to be changes in the kinds of materials made available, it will require the demands of the consumer. If parents do not question or challenge the presence of bias or stereotyping in print and digital content, then inequities will continue to prevail. What follows are suggestions for actions adults might take to recognize bias in print and digital materials for young children as well the omission of diversity. As consumers, we have the power to bring about changes in the current market by taking action such as:

- Review digital applications before downloading them to look for evidence of cultural bias, racial omission, and/or stereotyping.

- Select print and digital materials that represent diverse perspectives and opportunities for children to see themselves within texts as well as the diversity represented in the world. Ensure that diverse communities are not represented as distorted or caricatured. Ensure that European American (White) persons do not dominate the children's collection of applications but are reflected as one of many races.
- Write reviews of print materials, websites, or applications: Celebrate those that richly reflect our diverse world; call out those that discriminate through omission of persons of color, languages other than English, or that stereotype race, gender, and ethnicity through images, sound, voice, or content in print or digital materials.
- Make purposeful decisions on the print or digital content you choose to purchase or download to digital devices based on a critical look at content and images.
- Write letters to corporations that support discrimination, stereotyping, or bias to expose and express a consumer's displeasure with products that reflect these views.
- Post well-grounded critiques of digital and print material on social media.
- Engage colleagues in schools and childcare settings in evaluating print and digital materials used in schools and take action to inform district and state administrators of bias through omission, distortion, caricaturization, and stereotype.

- Engage other families in community efforts to address issues of discrimination in print and digital media as organized groups.

Transacting, Transmediating, and Transferring Within and Across Print and Digital Materials

Findings from this study suggest that, through ongoing access to and engagements with both print and digital materials, children began to transfer skills and strategies and make important connections across media. At the same time, the adults tended to have pro-print bias and assigned more legitimacy to print-based learning while the children typically selected digital engagements over print engagements. When considering implications from these findings, I reflected on current moves in some schools toward technology-dominant or technology-only instructional programs and teachers' concerns about addressing technology-based curricular standards. I worry that educators may be tempted to throw print materials out with the bathwater when findings from this study demonstrated the power of children's transmediation across media. This leads me to suggest that families, caregivers, and educators provide access to both print and digital materials. In this section, I discuss ways that adults can: (a) provide access to and engagements with print materials, (b) provide access to and engagements with digital materials, and (c) provide opportunities for children to build bridges between print and digital materials as they attempt to transfer new learning across media.

Provide Access to, and Engagements with, Print Materials

While the children in my study demonstrated a preference for digital materials, there were clear benefits of continued adult perseverance in the use of print materials. The adults found that conversation and emotional connections were heightened when they engaged with their children around print materials. When digital materials were not

available or would cause a disturbance, print materials were an important option. Additionally, the children learned a range of reading and writing skills and strategies as they engaged with print materials. While this is not new in terms of the literature in early and emergent literacy, this section affirms advice for adults to give children easy access to print materials and to motivate them to engage with print texts, important because, in a digital world, we do not need to throw out print experiences to be able to utilize all media to which we have access. This section also provides implications regarding the nonlinear nature of print transactions, a reminder that was important to me as I found myself questioning my own assumptions that print was a linear experience whereas digital was not.

Providing access to print. My findings affirm suggestions long provided in the field of early literacy about the need for easy access to print materials (Bissex, 1980; Butler & Clay, 1979; Martens, 1996; White, 1956) by placing them within reach in home and community settings or by providing regular access through public libraries. While lending libraries provide a valuable service, the findings also suggest that ownership of some titles was beneficial allowing for repeated reading and the greater likelihood that children would pick up books to read on their own. Children's easy access to books (low bookshelves, baskets, etc.) was also evident in this study, both in the homes and in the public library.

Public libraries offer families, caregivers, and educators a wide variety of print books to provide children with access to books. However, financial obstacles to book ownership continue to be a challenge in many families. One suggestion to overcome this challenge is through participation in *The Dolly Parton Foundation* program. This

program provides one free book each month for children from birth to age five. Participation in the program is free, but the foundation accepts private donations and encourages donors to sponsor children who participate in the program. Information about participation in the program can be found at http://www.achildgrows.com/.

Families, caregivers, and educators could also advocate for the reinstatement of *Reading is Fundamental*, a federally funded program that provided free books for low-income families. This program began in the 1960s as a grassroots effort to provide free books for young children and was subsidized by the federal government in the 1970s. Since that time, over 400,000 volunteers have put books in the homes of over 350 million young children. Funding for this program was eliminated in March, 2011. Adults could advocate for the reinstatement of this program (http://www.rif.org/us/get-involved/advocate/action-center.htm). Support for this program is currently provided through private donations which is an additional way to demonstrate support for this program. Donations may be made at http://www.rif.org/us/donate/ways-to-give.htm.

***Other print texts*.** The children in this study emulated adult uses of other print materials in their worlds and the children themselves utilized a range of print texts including but far beyond books. This corroborates much research in the area of home and community literacies (Dantas & Manyak, 2010; Heath 1983, 2012; Taylor & Dorsey-Gaines, 1988). Therefore, it is important for parents, caregivers, and educators to support children's access to other forms of print texts in home and community settings. Other print materials might include recipe books, mail, or magazines that children see members of their family engaging with as readers. Print materials found in community settings might include church bulletins, hymnals, or restaurant menus. These print materials that

children access and engage with provide opportunities for them to emulate adult reading behaviors and are an important part of their literacy growth.

Notepads and other spaces for writing and drawing. Findings also suggest that parents, caregivers, and educators provide young children with a variety of tools for writing within easy access. The children in this study emulated the way the adults in their world wrote. Consequently, they sought access to pens, pencils, crayons, and markers with which to write and draw. The children used those tools to write on notepads, placemats, and easels and learned about literacies as they use them. This further affirms early literacy research suggesting that parents, caregivers, and educators provide a variety of materials that allow young children to write in their worlds (Ray & Glover, 2008).

Engaging children with books. Findings suggest that the children in this study preferred digital applications to print book experiences. In fact, Aiden could only be enticed to read print books when offered extrinsic rewards through the library program. At the same time, both mothers recognized the value of side-by-side or lap reading experiences and made it a point to read aloud regularly to their children, as Jenny said, "loving the book together." Consequently, the children developed a love of books and had personal favorites that Jenny identified as *go to* books (Table 6.8).

Table 6.8.

The Children's Go To *Books During This Study.*

Llama Llama Red Pajama (Dewdney, 2005)
Llama Llama Mad at Mama (Dewdney, 2007)
Brown Bear, Brown Bear (Martin Jr., 1996)
Chicka, Chicka, Boom Boom (Martin & Archambault, 1989)
Goodnight Moon (Brown, 1947)
Goodnight, Gorilla (Rathmann, 1996)
Into the Tub (Beaver & Nolen, 2004)

Because of the struggles the adults in this study sometimes had engaging the children in print-based read alouds, Table 6.9 provides resources for families and teachers as they consider *how* to engage children in print experiences, particularly book reading

Table 6.9.

Resource about Reading Aloud

- *How to Get Your Child to Love Reading* by Esme Raji Codell (2003) - a collection of tips, book lists, and suggestions for parents about the importance of reading.
- *Living Under the Influence of Language and Literature* (Laminack & Wadsworth, 2006)- this annotated collection of children's books provides a brief synopsis of a wide variety of print books for reading aloud and would be use for parents and educators alike.
- *Reading Magic: Why Reading Aloud to Our Children Will Change Their Lives Forever* (Fox. 2008): A parent friendly book about the benefits of reading aloud to young children.
- *Unwrapping the Read Aloud: Making Every Read Aloud Intentional and Instructional* (Laminack, 2009): A guide for teacher (but also a valuable resource for parents and caregivers) on the value of reading aloud, suggestions for extending the power of read aloud experiences, and suggested titles.

Valuing and supporting nonlinear print engagements. Through this study, I learned that, while on the surface, it appeared to me that adults and children accessed print books and materials in linear ways (as opposed to nonlinear engagements with digital texts), their print transactions were, in fact, nonlinear. The ways adults and children drew on prior knowledge, moved back and forth within the text, transmediated through singing songs and connecting to personal experiences and other texts led to experiences that were very similar to the layers of engagements offered within digital content.

In fact, engaging with texts was much like the interactive and child-directed nature of digital transactions, and the nature of those nonlinear engagements was the characteristic that often kept the children engaged with print texts: pushing buttons on the side of the book; readers (adults) talking in voices of book characters, stopping to question, point, connect, going back and forth to favorite pages and events; and the children transmediating within and across sign systems such as music and art. These findings support the work of others in the field who have advocated for active and interactive engagements with print texts (Cullinan, 2000, Codell, 2003; Fox, 2001; Hoyt, 2006; Laminack, 2006, 2009) and lead to implications that families, caregivers, and educators provide children with and value print experiences that engage them in active, participatory, multilayered ways. Suggestions to encourage and illuminate nonlinear transactions with texts include recommendations that have been at the forefront of early literacy practice for decades:

- Choose a book with the child, a book that engages the child and reflects some elements in the child's worlds culturally, socially, and/or imaginatively.
- Look through the illustrations in the texts and encourage the child to make predictions about what will happen.
- Encourage the child's moves back and forth through the book to examine pages, illustrations, and talk about text. Move in and out of the text, the story, the characters as you make connections.
- Begin reading and demonstrate how you make connection to objects, characters, or actions in the text. Invite the child to do this as well.

- Let the child/children take the lead in the discussion during the reading as you move back and forth through the text. Stop as the child points to illustrations or makes connections.
- Encourage talk throughout the reading.
- Allow spontaneous connections to occur and capitalize on them: songs, other books, events, acting as characters, and so on.
- Encourage the child to draw pictures or write about the story.

Access to and Engagements with Digital-based Materials

Findings from this study suggest that young children transacted enthusiastically with digital materials and acquired a wide range of skills and strategies that they then transposed to print texts and that will be useful to them as they enter school. Findings also demonstrate the tensions and challenges faced as adults sought to provide balance concerning the children's use of digital materials and to address concerns about limited verbal interaction when children were engaged digitally. Related implications include suggestions for adults to: (a) provide access to electronic books and applications at home and at school, (b) provide opportunities for children to interact with others while engaged with digital materials, and (c) evaluate eBooks and applications for ease of use and appropriateness.

Providing access to electronic books and applications. Electronic books offered the parents in this study some advantages over print books. They offered ease of transport in their busy day-to-day lives as an entire library of books could be carried with children and made accessible with the push of a button. Additionally, eBooks were often less expensive than print books. Also, the children more readily engaged with electronic

books than they did with print books when self-selecting. It seems clear that electronic books have the potential to extend a child's thinking through the unique use of graphic displays, motions, sound, and color when they are used in ways that maximize the potential for social interactions and oral language development. Additionally, the layers of engagements provided in many electronic book applications have the potential to allow children to transmediate across multiple sign systems as they read and listen to books, solve puzzles, sing songs, draw or color pictures, or play interactive games.

Access to electronic books in schools and child care settings. There are many children's books available in digital formats that could be shared in classrooms first as a read aloud in print format and then revisited in the digital format for shared reading, strategy instruction, or center activities. Other resources for educators to use in accessing eBooks (some of which are available for free and others for fee) include:

- *Reading Rainbow* at http://pbskids.org/retired_readingrainbow.html
- *Tumble Books* at http://www.tumblebooks.com/
- *Bookflix* at http://teacher.scholastic.com/products/bookflixfreetrial/index.htm
- *Storyonline* at http://www.storylineonline.net/

Access to electronic books at home. There are many resources access to electronic books for young children at home? There are many free eBooks available to download for a variety of eBook platforms (Table 6.10). Some sites offer digital versions of print books with many of the same concepts of print features such as a two-page layout and virtual page turning. Many of the free eBooks offer books that are not presented in the same format as print books, but rather read top to bottom in much the same way that content is presented on web pages.

Table 6.10.

Suggested Resources for Digital Books

Resource	Description
http://www.ebook88.com/kidspage.htm	The website eBook 88 is a collection of links to a variety of eBook resources for children.
http://www.tbcjr.com	A paid subscription site, a collection of eBooks developed for elementary age children
http://www.amazon.com/Best-Sellers-Kindle-Store-Childrens-Early-Learning-Books/zgbs/digital-text/7090570011/ref=zg_bs_nav_kstore_3_155009011	Selections of children's eBooks available for fee and for free in a variety of electronic eReader platforms.
http://www.barnesandnoble.com/u/childrens-ebooks-kids-ereaders-ebooks-digital-animated/379003131=	Children's books available for purchase at a reduced price over that of the print based book, and offer for fee as well as free eBook selections.
http://www.magickeys.com/books/	A selection of free electronic texts for children. Some titles have the *read to me* feature.
http://en.childrenslibrary.org/	An international digital library of free eBooks in many languages.
http://store.scholastic.com/landing-page/landingpage/storia/shop-ebooks	A for fee digital collection of quality Scholastic titles. A free trial is available. Offers content for children from birth-teen years.

Providing opportunities for interaction with others while engaged with digital materials. Findings from the study demonstrate that children often did not engage in conversation as frequently while using digital materials and that the presence of headphones often led to even fewer conversations. At the same time, additional findings suggest that the children developed skills of focus and perseverance through their digital interactions. The importance of social interactions as a means of mediating learning is well documented in educational research (Vygotsky, 1978; Donaldson, 1978; Genishi & Dyson, 2009); however, it is standard practice in many schools to require students to wear headphones while they are using the computers in classrooms and computer labs. While this practice allows students to hear (without background interference) the commentary and musical accompaniment that mediate learning and

successful engagement, it often prevents children from extending their learning through conversations and further mediated learning with others.

Families, caregivers, and educators might overcome this obstacle if they provide a splitter (a jack for two headsets) so that two children can hear the same content and engage in conversations around the computer program or application. Additionally, adults could encourage young children to take off their headphones periodically in order to turn and talk to siblings, peers or classmates about what they are learning, challenges they are facing, or new learning they want to share. Adults could also involve children in conversations about their digital work following engagements. Because allowing students to talk about digital content has the potential to deepen learning in digital spaces (for children and adults), I suggest the following recommendations based on practices suggested for engagement with print materials:

- Much like children in many classrooms have reading buddies with whom they read and discuss print materials, children could have *App Buddies*. This would allow children to explore digital materials with other learners and extend their thinking.
- Following engagements with digital material, children could be guided to have *App Chats* in which they share new strategies, favorite apps, or ways they overcame challenges with the digital content.
- Children could read the print version of a book and talk about how they might present the text and interactive possibilities for it if they were app developers.

- Children could read the print version of an eBook and then discuss differences and similarities in content, connections, and gender and cultural representations.

Evaluate digital applications for ease of use and appropriateness. Previous implications suggested that families, caregivers, and educators examine digital materials for evidence of bias and stereotype. However, findings from this study also suggest the need for gatekeepers to consider the ease of access and appropriateness of digital materials. I found that I often selected applications based solely on the children's interest or the age recommendation provided on the application. However, the corporations that produce digital materials have no knowledge of the specific children who will access them, the children's interests, or the skills they may or may not have in accessing these digital materials; therefore, it is up to the parents, caregivers, and educators in children's lives to learn about the materials and then make informed choices about applications that will support *their* children.

Just as one cannot judge a book by its cover, one cannot judge an application by its icon. *AppStar Picks* (AppGrade, 2012) is an application that provides a list of over 400 applications for children, all of which have been tested and reviewed by five independent review teams made up of parents and teachers to determine the quality and suggested benefits of selecting these apps for use. The application is free and is available through iTunes at https://itunes.apple.com/us/app/id470578124. While I prefer to make my own judgments about applications based on the learning needs of individual children, this application helps to narrow the list of available content for children. An additional free

resource that provides recommendations for applications from teachers for teachers can be accessed at: http://www.appstoreapps.com/top-50-free-education-apps/.

As adults download applications for use with young children, it is important to consider what the applications offer and their appropriateness for specific children. I offer the following suggestions to guide those decisions:

- Once applications are selected and downloaded, it is important for parents and childcare providers to engage in the application to determine if there are roadblocks which might need explanations and modeling for young children to successfully engage with the application.
- Try out the free versions (often called the *lite* version) of applications before purchasing the full version. Promoters of these apps refer to this as the *try before you buy* approach. The *lite* version of applications provide limited access to the entire application, but it will provide an opportunity for adults to observe children engaged with the app and determine if it is appropriate for the child and beneficial as a tool for learning or for entertainment. This is also an effective way of determining if the application meets the requirements for quality before investing in the full version.
- Much like readers reserve the right to abandon a book, adults should reserve the right to delete applications that do not meet the learning needs of children or students.
- Use recommendations presented earlier in this chapter to evaluate applications for cultural and racial bias and gender stereotyping.

- Use the evaluation tool developed as a result of this study to evaluate the application for ease of access and usability (Table 6.11).

Table 6.11.

A Tool for Evaluating Digital Applications for Young Children

Application:				
Rate the application on a scale of 1-4 with 4 being strongly agree and 1 being strongly disagree.	4	3	2	1
1. The icon is recognizable and loads quickly.				
2. The application is easy for young children to navigate.				
3. The application is easy to access and does not present roadblocks such as popup advertisements or activities which cause frustration because they are beyond the child's current ability levels?				
4. The application is free from cultural/gender bias and stereotyping.				
5. The application provides meaningful learning opportunities in terms of content or digital skills.				
Total Score: Comments:				

Provide Opportunities for Children to Bridge the Uses of Print and Digital Materials

Findings suggest that the children began to transfer skills within and across print and digital materials as they had opportunities to self-select and engage with both media. Additional findings suggest that this allowed the children to begin to make important connections that bridged the skills and strategies learned within both environments. This leads me to recommend that families, caregivers, and educators provide opportunities for children to self-select and engage with print and digital materials seamlessly rather than as an *either/or* experience. Suggestions for ways to accomplish this include:

- Provide access to both print and digital based books and materials for self-selection at home throughout the day, at school during independent reading times, and in child care settings during free choice periods of the day.
- Alternate read aloud experiences using both print and digital materials encouraging children to note and talk about similarities and differences.
- Provide opportunities for children to explore print or digital materials through imaginative play experiences.
- Provide work stations/centers that allow children to self-select print or digital tools to accomplish various tasks.
- Notice when children apply concepts and skills learned in one medium to another and acknowledge the level of expertise in children's thinking that this requires.

Children as Active, Agentive Learners

Findings suggest that the children demonstrated expertise in taking on the roles of expert and apprentice in both print and digital environments, but were more likely to act as apprentice in print materials and expert with digital materials. Likewise, I learned that the children were more empowered and demonstrated greater confidence within digital materials than in print materials. These findings suggest that families, caregivers, and educators should learn to recognize children's expertise and abilities to act as experts and create opportunities for them to engage with both print and digital materials in ways that: (a) allow them to act in the roles of both expert and apprentice, and (b) provide opportunities for them to be active, agentive and empowered.

Allow Children to Act in the Roles of Both Expert and Apprentice

Findings from this study suggest that the children often took on the role of apprentice during engagements with print materials, but acted in more agentive ways as they took on the role of expert in digital environment. This suggests implications for adults as they provide opportunities for young children to move back and forth between the roles of expert and apprentice in their home, community, and school settings. The first step to achieving this is to recognize how adults often assume the role of expert when engaging with young children and begin to recognize children as experts. It can be difficult for adults to assume the role of apprentice when we see ourselves as the sole authorities, the sole teachers in children's lives. Some suggestions for becoming more aware of this tendency include:

- Notice how often you take the lead when introducing new content or materials. Allow the children to take the lead and make those decisions at times.
- Notice if you always take digital devices from children when they reach an impasse or if you make suggestions from the sidelines or give them time to solve problems on their own or seek their own resources to aid in solving problems.
- Consider whether or not you allow children to hold the print texts as you read together or the digital device as you engage with eBooks or applications: Do you allow children to take the lead as readers (page turners, storytellers, discussants, and digital device operators)?

- Examine the language you use when interacting with children and materials such as saying “Let me read to you” rather than “Come read with me.”
- Consider the assumptions you make about who holds the expertise with regard to both print and digital engagements.

In Chapter Four, Aiden was described as “Mr. Technology.” He was empowered as the resident technology expert in his family. He and the other children taught each other and their parents and grandparents. Even three-year-old Madilyn was a digital teacher. These findings suggest that adults support children’s sense of agency and expertise by noticing and naming their skill and knowledge with print and digital materials. Suggestions for providing opportunities for children to take on the role of expert and be acknowledged for their expertise include:

- Teach one child or a small group of children a new print or digital skill and allow them to teach the skills to others (siblings, cousins, or classmates).
- Observe children’s digital knowledge and note their expertise (Appendix C & D); use that information to direct other children to those who can teach them specific technological skills.
- Be willing to admit that you are not always the expert in digital and print environments as you problem solve issues with technology or read directions to learn how to use new devices, engage children as your teachers.
- Purposefully plan opportunities for children to demonstrate their expertise in print and digital materials with peers and adults:
    - Have a family game time at home, in community settings, or at school. Ask children to teach participants how to access and play a favorite board game, digital application, or read digital or print books.

- Plan and implement a Go to App Fair in which children create displays (much like a science fair display board or a digital version of it) about how to engage with a favorite application, and allow them to teach adults and peers as they discuss and demonstrate their knowledge.

- Provide opportunities for children/students to take the lead and act as teacher as they demonstrate expertise in order to teach others a skill they have such as beating all the levels on a digital application.

Provide Opportunities for Children to be Active, Agentive, and Empowered Using Both Print and Digital Materials

As the children in this study had opportunities to explore and create within digital environments, they exhibited confidence and empowerment. However, they did not appear as confident when using print materials. Implications from the findings suggest that families, caregivers, and educators might learn from the ways that digital materials support children to be active, agentive and empowered within print based materials as well.

Engage children with print materials in empowering ways. The children in this study were not as confident with print materials as with digital materials. Aiden in particular, exhibited negativity about himself as a reader. However, adults can support young children so that they move from *acts to awareness* (Clay, 1998) as they engage with print materials, ultimately able to name their expertise (through their awareness of it). In other words, children often engage in reading and writing like behaviors (engaging in the acts of literacy) before they move to awareness of themselves as literate, as readers and writers. It is this awareness that is empowering and leads to children acting as agents in further learning. In print contexts, Aiden did not have that awareness. This finding leads me to suggest ways that adults might support children in gaining confidence as well as awareness of their expertise with print materials:

- Demonstrate to children that readers choose books they want to read and encourage children to self-select books that they want read aloud; tell them they are experts as readers because they know how to choose books they love.
- Tell children that readers hold books and turn pages and encourage them to do this during independent and side-by-side reading experiences; let them know that their actions reflect their reading expertise.
- Recognize the print concepts (Clay, 2000) that children possess and name those concepts when reading with the children such as "You turned that book right-side up for me" or "You knew exactly when it was time to turn the page." Name this, to the children, as reading expertise skills.
- Encourage children to chime in (join in simultaneously) with you when reading familiar or repeated phrases. Acknowledge this to the children as reading.
- Talk to children as fellow readers. Name them as such as you talk about books together.
- Let children see you struggle with texts transactions (this was especially apparent in the study as I tried to read Dora books that included many Spanish words) and make explicit (a) the strategies you use to figure out text and (b) the fact that you are a reader but always meet challenges with text that is new to you.

Engage children with digital materials in empowering ways. The children in this study demonstrated active, agentive learning through opportunities to self-select digital devices and applications. They practiced digital behaviors with toy devices before

using the actual digital tools. They were able to access content by reading icons long before they could name letters and associate letters with sounds. They became quickly adept at swiping, scrolling, selecting, and dragging and dropping. Through this study, I learned that certain actions on the part of adults provided opportunities for the children to develop and demonstrate this kind of empowerment leading to the following implications for adults in children's worlds:

- Encourage engagements with toys that allow them to emulate adult uses of digital tools with more durable and child friendly features such as larger buttons for selecting content.
- Allow children to physically hold actual devices as they explore them. This is an important precursor to children actively engaging with digital tools on their own.
- Allow children to retain control of the device when they meet an impasse within an application; it is important to provide assistance without taking control of the device. Encourage children to try to solve problems on their own through guided questioning rather than responding immediately when children ask you to "fix it".
- Create a digital center in which you post icons (much like rebus images) that provide directions for how to engage with a new application and allow children to work together to master it. Then ask them to teach someone else how to engage with the application.

Additional Resources for Families, Caregivers, and Educators

There are many resources available to support adults as they support children's print and digital learning in the 21st century (Table 6.12). As adults consider these resources, this study's findings suggest the importance of ensuring that social interactions and personal relationships are not neglected as we embrace new technologies.

Table 6.12.

Additional Resources

- Mr. Bass Online- a blog maintained by Bill Bass in which he shares issues and insights concerning K-12 technology implementation in schools http://blog.mrbassonline.com/
- NCTE Connected Community: 21st Century Literacies is a discussion group hosted by Franki Sibberson that invites conversations about 21st century literacies. http://ncte.connectedcommunity.org/directory1/communitydetails/?CommunityKey=bfca44ea-bb29-4e5c-904e-f17eea140b80
- *ReadWriteThink*- A website supported by NCTE and the International Reading Association IRA which offers lesson plans and applications for http://www.readwritethink.org/

As the children in this study engaged in digital materials, they learned many valuable skills and strategies; however, this was at times to the exclusion of interactions with other children and the adults in their worlds. Therefore, I recommend a final resource: *Powerful Interactions: How to Connect with Children to Extend Their Learning* (Dombro, Jablon, and Stetson, 2011). The ideas put forth in this text have the potential to *power up* (Gee, 2011) suggestions from this study's implications, turning everyday interactions into *powerful interactions.* While the intended audience is preschool and

classroom teachers, the suggestions of *being present*, *connecting*, and *extend learning* are applicable to every individual who cares for or works with young children.

Methodological Implications

Throughout this study, I learned a great deal about the ways that the children used print and digital materials, but I also learned about myself as a researcher and about research methodology. I share reflections about the research process in the form of methodological implications for those who might engage in similar studies with family members or young children. Specific methodological implications include the need to (a) engage in ongoing reflection concerning assumptions and biases, (b) recognize the challenges and rewards of grandparent studies conducted with young children, (c) examine the pros and cons of electronic qualitative research software, and (d) recognize that writing can be a valuable tool for analysis.

Engage in Ongoing Reflection Concerning Bias

Perhaps the most important lesson I learned about research through conducting this study was the need to reflect on my own assumptions and biases. I was aware of the importance of facing my assumptions before entering into research (Hubbard & Power, 1999; Marshall & Rossman, 2006; Wolcott, 1995). I thought I had done just that as I examined my feelings about print and digital materials in the children's home and community settings. What I did not anticipate was that I held pro-print biases which at times kept me from seeing the possibilities of the children transmediating across both print and digital tools. I also believed that I understood cultural and racial bias and the importance of materials accurately reflecting a diverse world and not perpetuating the dominance or superiority of one culture or race.

Additionally I had to face the realization that my theory as an educator did not match my practice as a grandmother when I realized that I had not provided my grandchildren with print and digital content that mirrored the diverse world in which they lived. I mention it here as a methodological implication because had I not ultimately recognized that omission/bias, my findings would be very different. In the process of transcribing, I first became aware of my lack of cultural awareness in terms of the materials I provided for my grandchildren. Perhaps if I not been aware of the need to look for and acknowledge assumptions and bias, I would have never experienced my paper doll epiphany. This speaks to the value of the researcher remaining the primary instrument of analysis (as well as the value of doing one's own transcription). Although the incident that led to this awareness was captured on video, it might have just as easily gone unnoticed. Awareness of my bias did not end with an isolated transcription. It was further revealed in the analysis of the print and digital content that I had provided my grandchildren during the study. It was, through writing, receiving feedback, and rewriting that I came to the deepest understandings about how entrenched personal bias can influence the way data are collected, interpreted, and shared, as well as how remaining oblivious to bias might conceal important findings.

Challenges of Grandparent Studying Grandchildren

Language and literacy studies have a long history of parent and grandparent studies that have informed the field (Bissex, 1980; Butler, 1975; Long, 1998; Martens, 1996; Miller, 2012) so I understood the legitimacy and the potential power of my role as grandmother/researcher. However, being a participant observer within the framework of my own extended family had more challenges than I anticipated. At the same time,

because I was so familiar with the children and their parents, I was more aware of subtle nuances of their reactions and behaviors leading me to make decisions about my original plan for data collection which ultimately impacted the kinds of data I collected and my interpretation of it. These reflections lead me to suggest implications for: (a) collecting data with young children, (b) remaining responsive to participants, and (c) remaining aware of selective attention.

Collecting data with young children. Throughout this study, I came to understand that data collection with very young children is both exciting and challenging. I confronted challenges for example, in the use of data collection tools that invaded children's play and distracted their attention. The use of video and digital cameras with the children proved to be a challenge for me as a researcher. Perhaps it is the inquisitive nature of toddlers and preschoolers to want to know why adults do what they do, but I found challenges when setting up a video camera where my grandchildren were using print and digital materials. I could not seem to get the camera effectively positioned to capture their spontaneous interactions as they moved around the room. I also have a great deal of footage of my footstool and little hands reaching up into the field of the camera lens. I often resorted to capturing still photographs instead of video recording. These photographs provided copious amounts of data about the literacy events in which the children engaged, but like so many other data collection methods were limited to my decision to snap a shot or the children's willingness to continue engagement as I raised my smart phone. In addition, I was constantly aware of Wolcott's (1995) reminder that still photographs freeze moments in time and that, without accompanying field notes to frame the experience and provide voice to the participants, photos are just that, still.

Responsiveness to participants. Throughout this study, I tried to remain responsive to the participants, often at the risk of missing important opportunities to gather more data. As discussed in Chapter Three, this was the case when I made the decision to limit the number of observations I made in their homes. I sensed that these observations made the parents uncomfortable, as if I were putting them under a microscope and examining their every move. Instead, I decided to let impromptu conversations and communicating through social networking take the place of these in-home observations, with the exception of a very few times that I was able to video tape in the children's homes and make informal observations. The implication of this for researchers is the awareness that our research imposes on the privacy of participants, and as researchers (even when participants are your own children and grandchildren) we must respect the need for normalcy in their day-to-day lives.

I also had to accept that my attempt to get the mothers to create a chart of the applications they had on their iPads was unsuccessful. When I asked each of the mothers about it at a later time, they both responded with a comment about how they had been meaning to do that but had just not taken the time to do it. I inferred that this was not something they wanted to spend time doing and member checking confirmed that assumption. As a researcher, I was imposing on their lives and could not ask them to do more than they were willing to do.

Selective attention and "Why are you writing in that notebook again?" As discussed in Chapter Three, I know there were probably many times when, because of selective attention, I failed to notice an important interaction. But there were also times when the children redirected my focus. For example, when Aiden grew tired of me

watching and recording his every move very early in the study, he often rolled his eyes at me as I set up the tripod reminding me of how intrusive the equipment could be in the children's play area of my home. I was often met with a *there you go again* look from him as I quickly jotted something down in my field notes, fearful that I would forget what he said or did. Madilyn and Makayla were also aware of my constant photographing, videoing and note taking. Perhaps I was so preoccupied with making sure I was not missing the ways that the children were using print and digital materials that I did not engage as frequently with them to build Legos or curl up on the couch together to watch a movie and eat popcorn. Thus, while data were collected in settings that were as naturalistic as possible, the imposition of my study surely changed our typical interactions in some ways. In many ways, this study may have rewritten part of their literacy narratives as my constant observation and questioning may have changed the ways that the children and adults used print and digital materials.

The primary implication from these reflections is for researchers to maintain awareness that the mere presence of the researcher and the awareness of the observations by participants have the potential to change their natural behavior or interactions. This affirms the work of other qualitative methodologists (Long, 1998; Spradley, 1980; Wolcott, 1995; Street & Heath, 2008) who recommend that researchers in the worlds of children should:

- Remain cognizant that you are imposing on participants lives and in many ways altering their day-to-day existence.

- Consider setting up several video cameras in the main data collection area. Setting up multiple cameras out of the reach of children would provide multiple perspectives.
- Allow the children to video each other and view the recordings to take the mystery out of the use of the device.
- Keep a camera or recording device in your pocket at all times to capture impromptu events.
- Keep a small notebook close to all data collection sites so that you can catalog each photograph taken with brief anecdotal notes about what occurred during a still photograph. This will make open coding much easier upon uploading.
- Upload at the end of each data collection period. Your memory will fail you.
- Include member checking with young children as well as adults. They can often inform your thinking about observations.

The Use of Digital Tools for Data Collection, Storage and Analysis

Throughout the course of this study, I learned many lessons about the use of technology for data storage, coding and ongoing analysis. I made use of a qualitative research program designed to organize and catalog a variety of data sources. This tool provided a way to manage, code, and analyze a large quantity of primary documents. However, I encountered advantages and disadvantages through my use of a qualitative data management program (Table 6.13).

Table 6.13.

Pros and Cons of Qualitative Data Analysis Programs

Pros	Cons
The program supports a large variety of data (such as Word documents, photographs, and video).	Glitches in computer software could corrupt files and make data inaccessible.
Open coding allows for ongoing reflection throughout the data collection period and memos.	Transcriptions of videos must to be done with additional software and uploaded.
Webinar support for new users.	Portability is between multiple computers. The data base must be updated on the same computer.
A variety of reports can be generated and printed	Large files must be linked from the original file and must be stored on the same computer.
Data can be sorted into families for additional layers of analysis	Digital video must be compressed due to storage capacity problems.

Suggestions based on lessons learned from using this software are:

- Data should be uploaded regularly and reflected on at the time of uploading.
- Computer programs such as these cannot take the place of the ethnographer as the primary tool of analysis because the researcher must still actively engage with the data through assigning open coding, interpreting the significance of observations, look for patterns and themes within the data which ultimately lead to findings and implications.
- It would beneficial to select a program that allows for video transcription within the program rather than requiring external uploads following transcription in another program.

Writing as a Tool for Reflection and Data Analysis

Throughout this study, writing was a primary tool of data collection, reflection, and analysis. Research supports this (Marshall & Rossman, 2006; Wolcott, 1995), but it

was through the process of conducting this study that I came to embrace writing as a researcher's most valuable tool. The act of organizing the findings as a writer also clarified and deepened my analyses. The primary implication from this for researchers is again, affirmation of the advice of other qualitative researchers (Long, 1998; Street & Heath, 2008) to recognize that data analysis is not finished when you sit down at the keyboard to write about your findings. The act of revision regularly added additional layers of meaning as I attempted to clarify my interpretations and capture data stories in words. Further methodological implications include advice for researchers to remain flexible in the organization of findings, be willing to collapse and combine findings, in a continuous state of responsiveness to the data so that you can capitalize on the insights that the process of writing can bring to analytical conclusions.

The Importance of the Research Question

In the process of conducting this study, I learned a great deal about conducting qualitative research, not the least of which is the importance of the research question in framing the direction of the study and the ways that it impacts every aspect of the research. The research question in this study was broad: *What can I learn from looking at the literacy practices of three preschool children as they engage with both print and digital materials in home and community settings*? This question allowed for a wide lens through which I was able to view the literacy practices of the children as they used print and digital materials as well as how the adults viewed and provided models for the children. Consequently, the findings and implications were far-reaching.

Additionally, my focus on literacy practices led me to look closely at *what* the children were doing with print and digital materials rather than how they were learning

within these environments (which proved to be a critical difference as I analyzed data). This leads me to believe that this study might have been more effective if done as a pilot study. Had I conducted a pilot study, I would have uncovered many of the biases that the adults (including me) held about print and digital materials and the presence of bias and stereotyping in the materials made available to the children. However, having constructed those findings through this work, I am led to new questions that can be addressed in future research as the field considers young children and the uses of print and digital materials.

Implications for Further Research

The findings from the study lead me to ask additional questions which have the potential to further current understandings about how young children navigate the relatively uncharted waters of 21st century of early literacy development. Suggestions for further research include studies that: (a) are similar to this study but conducted with participants from a range of socioeconomic, geographic, racial, and ethnic communities, (b) examine the specific ways children transact with print and digital version of the same text, (c) investigate the use of print and digital materials by children at school, and (d) critical ethnographies concerning bias and stereotype in print and digital materials.

Similar Studies with Participants in Other Contexts

This study focused on three White children, one boy and two girls in a middle class rural home and community settings in the southeastern United States. To further understand issues of access and engagement, stereotype and bias, similar studies could explore digital and print interactions in homes, communities, and educational environments to include children of color, children learning English as an additional

language, and children from low-income urban and rural communities. Researchers might also increase the number of participants or reduce the sample size to one case study to shed additional light on this area of research. Other settings which might be explored could be the homes of the children's friends, the homes of additional extended family, or other community settings such as the soccer field, hair salons, or the playground.

Examining Transactions with Print and Digital Versions of the Same Text

In this study, I found that the children transacted differently with print and digital materials. Additionally, I found that adults valued print texts differently than they did digital texts. The adults' views about print and digital materials seem to have been influenced by a pro-print bias, but I believe that there is need for additional research to compare and contrast young children's transactions with print and digital formats. Areas of possible further research are:

- Studies that examine how toddlers transact with digital books when used as read aloud experiences.
- Studies that examine the way preschoolers transact with digital texts when accessing the *read to me* feature.
- Studies that examine the ways preschoolers transmediate within and across texts when accessed in both print and digital formats.
- Choices that young children make when given the opportunity to self-select digital or print texts.

Studies Surrounding the Uses of Print and Digital Tools in Schools

While this study focused on the literacy practices and the uses of print and digital materials by preschoolers in home and community settings, there are implications for additional research in school settings. Findings suggest that the children learned a range of skills through transactions with print and digital materials and will enter school with an

array of print and digital concepts. Because teachers today are increasingly asked to integrate digital technologies within their daily curriculum and often turn to digital tools to extend, enrich, and at times, replace their print materials, it seems potentially informative that future research would examine the way print and digital materials are used in schools today (particularly with regard to early childhood education). Studies that might add to current understandings include:

- Examining the impact of allowing students to self-select from print and digital books during independent reading on fluency and comprehension.
- Examining the impact on levels of engagement in shared reading experiences when using print versus digital books.
- Examining how comprehension might be impacted by using digital enrichment activities which accompany electronic books.
- Examining the benefits and challenges of headphones as they are currently utilized in digital learning environments in schools.

Critical Ethnography in Print and Digital Environments

Children today are bombarded with sounds, images, and texts encoded with messages about how to be in the world. These messages are, in many ways, writing the narratives of childhood in the 21st century, influencing self-image, and either interrupting or perpetuating societal biases and injustices. The print and digital materials to which the children had access in this study had the potential to open or close opportunities to be exposed to diverse perspectives. Thus, I feel that this study can serve as an impetus for critical research that could potentially interrupt narratives that perpetuate social bias and deficit perspectives of children and adults. Implications for further research in the area of critical ethnography concerning print and digital materials focus on what Myers (2014) identified as *The Market*, the consumers who are attracted to materials and then access

them as normalized elements of society. I propose the need for critical ethnographic studies to:

- Explore ways in which dominant/privileged groups are represented in print materials and digital applications within diverse settings such as daycare centers, preschools, or school settings.
- Explore ways in which under-represented and marginalized groups are represented (or not) in print materials and digital applications within diverse settings such as daycare centers, preschools, or school settings.
- Examine the ways in which increased access and exposure to digital media may be limiting or increasing access to diverse perspectives.
- Investigate how young children perceive nonhuman characters in digital applications and the impact that has on their developing understandings about race and gender.
- Examine the digital application market for evidence of cultural or gender bias.
- Examine the digital market in terms of privileging of access.

Conclusion

Findings from this study describe some of the ways that three young children engaged in literacy practices in the 21st century. Data were viewed through a sociocultural lens that valued social interactions as embedded in cultural contexts. Much like Wertsch (1991) who posited that "action is mediated and that it cannot be separated from the milieu in which it is carried out" (p. 18), I recognize that my choice of participants, the location of the study, and the methods I employed influenced the findings and ultimately, the implications. The stories told were brief glimpses into the literacy stories being written in the lives of my three grandchildren. Thus, I do not share findings to provide what Clark (2013) termed a "parent app" (p. viii) with generalizable implications. Instead, I offer insights with the potential to inform family members, caregivers, and educators as they seek to offer mediated learning experiences for young

children in print and virtual spaces. While these findings and implications do not offer definitive answers about how children should be learning about and through technology, they do serve to problematize the use of technology in early childhood education.

Perhaps one of the biggest issues I dealt with as I engaged in this study was reconciling a nostalgic view of my own print experiences with the realities of a digital society. The photo of Makayla holding her first library card and a DVD as the first item borrowed from the public library (Figure 6.2) encapsulates my dilemma and serves as a metaphor for much that was explored in this study. Rushkoff (2013) predicted that one of the negative impacts of the times in which we live (what he termed *Present Shock*) to be the collapse of narratives, a loss of the linear stories that help humankind make sense of experience and share those understandings with the next generation. Much like Rushkoff (2013) my pro-print biases gave me some concern for the future of print texts as I observed the children's preference for digital literacies and adults' roles in supporting and/or expanding those preferences. The children's mothers and I feared that, in this fast-paced, *ever-on* society in which we live, there might be a loss of the stories which help children make sense of the world and help us better understand each other as human beings. However, findings led me to understand that digital tools do not have to threaten narrative story, and in fact, can allow children to transact in empowering, agentic ways. Findings also reminded me that we also transact with print texts as narratives in nonlinear ways which helped me appreciate the nonlinear qualities of the digital experiences.

Figure 6.2. A print based past meets 21st century literacies.

Through this study, I came to recognize value in children having access to and engagements with both print and digital materials, and that children can experience the best of both worlds as the adults in their lives recognize the critical role they play in the selection of, access to, and engagements with, these materials. As families, caregivers, and educators work to fully integrate new technologies into their day-to-day lives, it is not just about the medium (be it print or digital); it has as much to do with the messages that are read by children as they access and engage with materials. Messages of bias and stereotypes are sent overtly and covertly through all materials with which young children transact. Adults, as gatekeepers, have a responsibility to be enlightened facilitators who consider print and digital materials and engagements with a critical eye. Recognizing that we *are* the market (Myers, 2014), families, caregivers, and educators have the power to keep watch on the market and consider what we might be *letting it in* without question.

It is difficult to go a day without hearing someone offer a solution to a problem with the familiar phrase, *there is an app for that*. Indeed, advancements in technology have afforded us many tools to expand our ability to think and act in the world, but as Beers (2010) stated, "there be dragons" (p.341). Those charged with the responsibility of rearing and educating children today, do so in a time of high stakes testing and mandates that could "lead to narrow definition of what counts as language, literacy, and knowledge (Long, 2011, p. vii)." One of those mandates is the inclusion of technology in early childhood settings. While technology has brought about many changes in the ways in which we live, work, and play, some things remain a constant, those principles that will "hold true even in these new oceans" (Beers, 2010, p. 341), not the least of which is the desire for families, caregivers, and educators to equip children with the tools they need to be successful in the world as they grow into active, agentive members of the 21st century literacy club. It is my hope that this study will add to the collective narratives within the field and lead families, caregivers, and educators to recognize the critical nature of their role in the literacy lives of young children. There is not an app for that.

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APPENDIX A: CONSENT FORM

Consent Form

There is an App for That: Uses of Print and Digital Materials in the Lives of Three Preschoolers
Rebecca H. McCraw

Introduction and Purpose
You are invited to participate in research study conducted by Rebecca McCraw. I am a doctoral candidate in the Language and Literacy Department at the University of South Carolina. I am conducting a research study as part of the requirements for my degree in *Language and Literacy* and I would like to invite you to participate. The purpose of the study is to look closely at the ways preschoolers use print and digital materials in home and community settings and how that use leads to the development of concepts of print in traditional and new ways. This form explains what you will be asked to do if you decide to participate in this study. Please read it carefully and feel free to ask any questions you like before you make a decision about participating.

Risks of Participation
There are no known risks associated with participating in this research except a slight risk of breach of confidentiality, which remains despite steps that will be taken to protect your privacy. Since the children are my grandchildren, there is no possible way to maintain complete anonymity. Because the children are minors, the parents will have final say in what will be included in the data to be used in my findings. The engagements that the children take part in will be what is occurring naturally in their literacy development and will not involve any contrived experiences that might be deemed harmful.

Description of Study Procedures
This study will be conducted over a five mother period of time. It is a multiple case study in which I will be observing the literacy engagements of my three grandchildren over time. Observations will be conducted in my home, the children's homes, the school that the five-year-old attends, and sitter's home. In addition to observations, interviews will be conducted with all adult informants to determine the current uses of print and digital material by the three children. Other data collection tools will include the use of audio and video recordings of the children in various literacy engagements over time. The parents will be asked to complete a questionnaire of materials found in the home before the initial interview to allow time to reflect on what is currently available. The mothers of the children will be asked to keep a weekly reflective journal (either electronically or written) and, at times of their own choosing, to audio and video tape the children in various settings. This will require a weekly time commitment of less than two hours.

There will be a pre and post interview of the parents, teacher, and sitter which will take less than an hour to conduct. Weekly observations by me will be conducted with the children in one-on-one settings as well as group settings with all three children. A typical week is outlined in the table below:

Typical Week of Observations over the Data Collection Period

Setting	Aiden	Madilyn	Makayla
Children's Home	1 hour per week	1 hour per week	1 hour per week
In my home	3-5 hours per week	3-5 hours per week	3-5 hours per week
The Public Library	1 hour per week	1 hour per week	1 hour per week
Extended observation in my home (overnight)	1 time per month	1 time per month	1 time per month
My Home	At various times to be arranged with the parents, all three children will be observed in other settings such as church, the park, or in my home.		
Other settings	TBD	TBD	TBD

Benefits of Participation
Taking part in this study is not likely to benefit you personally. However, this research may help us understand more about how young children are developing both print and digital literacies in society today. The parents of the children may benefit from participating in this study by having opportunities to have time alone with your spouse as well as developing a deeper understanding of your child's/children's literacy development.

New Study Findings (only required for greater than minimal risk studies)
In the event that findings during the study change the nature of risk factors to the children, I will notify you and provide you with a revised consent form.

Costs
There will be no costs incurred by the participants in this study. I will provide parents with audio and video equipment (including a tripod for setting up video-recording) and there will be no expense during any of the observation times. I will provide all transportation to and from the observation settings included in the study.

Payments
You will not receive monetary payment for participation in this study.

Circumstances for Dismissal from the Study*
You may be dismissed from the study without your consent for various reasons, including the following:

- If new scientific developments occur that indicate the study is not in your best interest.
- If the investigator believes that it is not in your best interest to continue in the study.

- If unforeseen circumstances prevent you or the children from participating the study.

Compensation for Injury*

In spite of all precautions, you may suffer complications or injuries as a result of participating in this study. If such complications arise, the researchers will assist you in obtaining appropriate medical treatment, but any costs associated with the treatment will be billed to you and/or your insurance company. The University of South Carolina has not set aside funds to compensate you for any complications or injuries, or for related medical care. However, by signing this form, you are not waiving any of your legal rights.

Confidentiality of Records

Participation will be as confidential as possible since the study is being conducted with my grandchildren. In order to make allowances for the lack of confidentiality, parents and other informants will have the opportunity to review any transcripts, field notes, or videos before these data are used in the findings. The parents will determine if the children's actual names or pseudonyms will be used in the presentation of the findings. The results of the study may be published or presented at professional meetings. While I will make every effort to protect your privacy, it cannot be absolutely guaranteed.

Contact Persons

For more information concerning this research, or if you believe you may have suffered a research related injury, you should contact:

Rebecca McCraw
170 Whispering Pines Rd.
Gaffney, SC 29341
mccrawrh@gmail.com

Or my advisor:
Dr. Susi Long
The University of South Carolina
803-777-5901
susilong@sc.rr.com

If you have any questions about your rights as a research subject, you may contact: Thomas Coggins, Director, Office of Research Compliance, University of South Carolina, Columbia, SC 29208, Phone - (803) 777-7095, Fax - (803) 576-5589, E-Mail - tcoggins@mailbox.sc.edu

Voluntary Participation

Participation in this study is voluntary. You are free not to participate or to withdraw at any time, for whatever reason, without negative consequences. In the event that you do withdraw from this study, the information you have already provided will be kept in a confidential manner.

Use of Pseudonyms in the study:

_____I prefer to have my given name used in the study.
_____I prefer the researcher use a pseudonym in place of my name in the study.

_____ Date:_____
Signature

For parents of the minor primary participants:

_____ I prefer that my child's/children's given name(s) be used in the study

_____I prefer that the research use pseudonyms in place of my child's/children's name(s) in the study.

_____ Date:_____

Parent's Signature

Signatures /Dates

I have read (or have had read to me) the contents of this consent form and have been encouraged to ask questions. I have received answers to my questions. I give my consent to participate in this study, although I have been told that I may withdraw at any time without negative consequences. I have received (or will receive) a copy of this form for my records and future reference.

_____ Date:_____

Signature of Informant

As the parents of the minor child/children involved in this study, we give consent for our child/ children (under six years of age),

_____, to participate in this study of the ways in which young children are using both print and digital based materials in multiple contexts over time. I have the right to withdraw from the study at any time without negative consequences. I have received (or will receive) a copy of this form for my records and future reference.

_____ Date:_____

Mother

_____ Date:_____

Father

As a representative of this study, I have explained to the participant or the participant's legally authorized representative the purpose, the procedures, the possible benefits, and the risks of this research study; the alternatives to being in the study; the voluntary nature of the study; and how privacy will be protected.

_____ Date:_____

Rebecca H. McCraw

As a witness, I attest that the consent form was read by (or to) the subject, the research purpose, procedures, risks, and benefits were explained to the subject, questions were solicited and if the subject had any questions, they were answered to the subject's satisfaction. In my judgment, the subject voluntarily agreed to participate in the study.

_____ Date:_____

Witness

APPENDIX B: QUESTIONAIRE OF HOME USE OF
PRINT AND DIGITAL BASED MATERIALS

Questionnaire of Home Use of Print and Digital Based Materials

The following is a questionnaire to be completed by the parents of the primary participants prior to the initial interview:

Please check all that apply

1. About how many children's books do you have in your home
   - □ 0-5
   - □ 10-20
   - □ 20-50
   - □ 50 or more

2. What other kinds of print material do have in your home or have your children seen you read on a regular basis:
   - □ Magazines
   - □ Newspapers
   - □ Pamphlets
   - □ Printed email
   - □ Recipe books
   - □ Directions for assembling products
   - □ Websites
   - □ Other:_____

3. Check all the ways that you write and ways your children have seen you write in your home and community:

   - □ Hand written lists
   - □ Hand written directions
   - □ Hand written letters
   - □ Hand written reminder notes
   - □ Hand written greeting cards
   - □ Using a word processor for work or pleasure
   - □ Texting using a cell phone or smart phone
   - □ Social networking (i.e. Facebook, MySpace, etc.)
   - □ Writing or responding to blogs
   - □ Using a GPS (keying in the address)
   - □ Other:_____

3. Which of the following do you have in your home (if you have more than one, please indicate the number to the right):
   - □ Personal computer
   - □ Smart phone
   - □ Laptop
   - □ iPad
   - □ e-reader (Circle all that apply: Nook, Kindle, Android Tablet, other)
   - □ DVD Player
   - □ Gaming system (name:_____)

4. Check all that apply

   - □ I allow my child/children to play with my smart phone at times to keep them occupied.

   - □ I have downloaded applications for my children to play on my phone.

   - □ I have purchased commercial DVDs for my child/children to watch for educational purposes

   - □ I have purchased commercial DVDs for my child/children to watch for entertainment.

   - □ I feel that some commercial DVDs are more educational than others.

   - □ I have downloaded applications or computer programs that are age appropriate for my child/children.

   - □ I believe that knowing how to use technology will be an important part of my child's schooling.

   - □ I believe that it is more important to learn the basics of reading and writing in school than to learn how to use technology.

In the space below, please feel free to ask any questions or expand on any of the survey questions above:

_____

_____

_____

_____

_____

_____

APPENDIX C: EARLY CHILDHOOD OBSERVATION TOOL OF DIGITAL CONCEPTS of COMPUTERS

Early Childhood Observation Tool of Digital Concepts of Computers

The student can:	Observations:
1. Manipulate the cursor with the mouse causing the cursor to move.	
2. Recognize that the movement of the mouse can be seen on the screen.	
3. Locate and select the ENTER key on the keyboard.	
4. Select applications, programs, or content using the left or right click of the mouse or touch pad.	
5. Demonstrate an understanding that digital content may be presented top down or left to right.	
6. Use the scroll feature on the mouse or keyboard to scroll down the page to access additional content.	
7. Select, drag, and drop content using the mouse	
8. Use the mouse to select desired content (such as an answer or an icon to continue to an additional page.	
9. Deselect programs and return to the home screen by selecting the X in the top right corner of programs or applications	
10. Correctly identify the keyboard, monitor, and mouse.	
Comments:	

Note: This observation tool is intended to help teachers recognize some of the many skills that children may bring to school and provide opportunities for teachers to validate this knowledge as evidence of real learning that children do in home and community settings as well as in schools

APPENDIX D: EARLY CHILDHOOD OBSERVATION TOOL OF DIGITAL CONTEPTS OF TOUCH SCREEN DEVICES

The Early Childhood Observation Tool of Digital Concepts of Touch Screen Devices

The student can:	Observations:
1. Locate and engage the button to turn on the device.	
2. Swipe the main screen to open access to applications and enter pass code when required.	
3. Recognize icons are used to select and gain access to applications.	
4. Swipe the screen to gain access to additional pages of applications.	
5. Self-select an icon to activate an application.	
6. Recognize that there are levels of engagement (activities) within applications and can self-select using the touch screen.	
7. Rotate the device so that content is in landscape or portrait and move the device to control action and movement within applications when applicable.	
8. Turn pages and access content by swiping right to left or top to bottom.	
9. Select, drag & drop content within applications.	
10. Navigate back to the home screen to select a different application or activity.	
Comments:	

Note: This observation tool is intended to help teachers recognize some of the many skills that children may bring to school and provide opportunities for teachers to validate this knowledge as evidence of real learning that children do in home and community settings as well as in schools.

APPENDIX E: PRINT AND DIGTIAL MATERIALS
REFERENCED IN THE STUDY

Children's Books Referenced

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Table E.1

Applications and eBooks Referenced

Amazing Human Body (Global Softtware Publishers, 1998) *Amazing Match* (Joy Preschool, 2012) *Andy's Art Kit* (Kidsmart, 2011) *Angry Birds* (Rovio Entertainment, 2012) *Apps Gone Free* (App Advice, 2011) *Appstars Picks* (AppGrade, 2012) *A Song for Miles* (Russell, 2011) *Bug Games* (Busy Bee Studios, 2012) *Car Racing* (Hunry Bolo, 2011) *Chic Baby* (Touch Apps, 2012) *Chicktionary* (Blockdot, 2011) *Crazy Monster Trucks-Escape* (GameAnax Inc, 2012) *Create a Car* (ABCya.com, 2012) *Dino Rush* (Nemoid, 2012) *Doodle Buddy* (Pinger, 2012) *Dora Loves Boots*(Nickelodeon, 2011) *Dora's Dress Up Adventure* (Nickelodeon, 2012) *Dora's Enchanted Forest* (Nickelodeon, 2012) *Dora's Skywriting ABC Adventures* (Nickelodeon, 2012) *Finding Nemo Interactive Comic* (Disney Pixar, 2012) *Flat Stanley* (Flatter World, 2010)	*Hay Day* (Super Cell, 2012) *I Like…*collection (Grasshopper Apps, 2011) *Jake's Neverland Pirate Adventure* (Disney, 2012) *Kid's Wheels* (Kid Baby Toddler LTD, 2012) *La Casa de Dora* (Nickelodeon, 1999) *Ladybug Girl* (Soman, 2008) *Llama Llama Red Pajama* (Dewdney, 2005) *Meet Biscuit* (Capucilli, 2012) *Mickey's Road Race Rally* (Disney, 2012) *Minnie's Bow Maker*(Disney, 2012) *Nick Jr. Draw and Play* (Nickelodeon, 2012) *Royal Party* (Disney, 2012) *Scrabble* (Electronic Arts, 2007) *Stellaluna* (Cannon, 1993) *Super Why* (PBS Kids, 2011) *Super Why ABC* (PBS Kids, 2012) *Super Why Paint* (PBS Kids, 2011) *Teach Me 2nd Grade*(24 X 7 Digital LLC, 2012) *Teach Me Kindergarten* (24 X 7 Digital LLC, 2012) *Teach Me Toddler* (24 X 7 Digital LLC, 2012) *Write My Name* (NCSOFT, 2012)

Table E.2

Television and Movies Referenced

Blues Clues (Nick Jr. 2012) *Cars* (Disney Pixar, 2011 *Doc McStuffins* (Disney Jr., 2012) *Dora the Explorer* (Nick Jr., 2007)	*Mickey Mouse Clubhouse* (Disney, 2006) *Phineas and Ferb* (Disney, 2007) *Super Why* (PBS Kids, 1995)

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  - "Where are the People of Color in Children's Books" by Walter Dean Myer (2014). Access at http://www.nytimes.com/2014/03/16/opinion/sunday/where-are-the-people-of-color-in-childrens-books.html?_r=0
  - "The Apartheid in Children's Literature" by Christopher Myers (2014). Access at http://www.nytimes.com/2014/03/16/opinion/sunday/the-apartheid-of- childrens-literature.html
  - "Mirrors, Window, and Sliding Glass Doors" by Rudine Sims Bishop. An article about the importance of multiculturalism in books. It is found on the Reading is Fundamental website. Access at http://www.rif.org/us/literacy-resources/multicultural/mirrors-windows-and-sliding-glass-doors.htm

- The School Library Journal provides a list of culturally diverse books. Access at http://www.slj.com/2014/05/diversity/culturally-diverse-books-selected-by-sljs-review-editors#_

- **21st Century Literacy**

  - The Connected Community-a forum supported by The National Council of Teachers of English explores a variety of topics including 21st century literacy. Access at http://ncte.connectedcommunity.org/home

  - Edutopia is a site funded by the George Lucas Foundation. Access at http://www.edutopia.org/

  - "A Framework for 21st Century Curriculum and Assessment" by The National Council of Teachers of English. Access at http://www.ncte.org/positions/statements/21stcentframework

  - NCTE Statement on Multimodal Literacy and Technology. Access at http://www.ncte.org/governance/MultimodalLiteracies.

  - "New Literacies and 21st Century Literacies" published by the International Reading Association. Access at http://www.reading.org/Libraries/position-statements-and-resolutions/ps1067_NewLiteracies21stCentury.pdf

  - The Partnership for 21st Century Literacy provides a framework and visual of 21st century literacy. Access at http://www.p21.org/storage/documents/1.__p21_framework_2-pager.pdf

  - The Partnership for 21st Century Literacies provides a video that demonstrates that children today need more than the 3Rs to be successful. Access at http://www.p21.org/our-work/resources/for-educators/1007

  - Mr. Bass Online- a blog maintained by Bill Bass in which he shared issues and insights concerning K-12 technology implementation in schools. Access at http://blog.mrbassonline.com/

  - *ReadWriteThink*- A website supported by NCTE and the IRA which offers lesson plans and resources. Access at http://www.readwritethink.org/

  - "Standards for the 21st Century Learner" by the American Library Association. Access at http://www.ala.org/aasl/standards-guidelines/learning-standards

- **Accessing Print and Digital Materials**

  - Advocacy for the reinstatement of Reading is Fundamental (RIF). Access at http://www.rif.org/us/get-involved/advocate/action-center.htm

  - ALA- American Library Association website offers tips and additional resources about reading aloud. Access at http://www.ala.org/aasl/aboutaasl/aaslcommunity/quicklinks/el/elread

  - Amazon best selling eBooks for fee and for free. Access at http://www.amazon.com/Best-Sellers-Kindle-Store-Childrens-Early-Learning-Books/zgbs/digital-text/7090570011/ref=zg_bs_nav_kstore_3_155009011

  - Barnes and Noble's children's eBooks for fee and for free. Access at http://www.barnesandnoble.com/u/childrens-ebooks-kids-ereaders-ebooks-digital-animated/379003131

  - Bookflix is a for fee site that also provides many award winning children's books in digital formats. Access at http://teacher.scholastic.com/products/bookflixfreetrial/index.htm

  - The Dolly Parton Foundation. Access at http://www.achildgrows.com/

  - eBook 88 is a web resource for accessing a variety of eBooks. Access at http://www.ebook88.com/kidspage.htm

  - The International Children's Digital Library. Access at http://en.childrenslibrary.org/

  - Magic Keys provides many free eBooks for download. Access at http://www.magickeys.com/books/

  - Reading Rainbow provides many eBooks of award winning children's books. Access at http://pbskids.org/retired_readingrainbow.html

  - Storia eBook by Scholastic (for fee). Access at http://store.scholastic.com/landing-page/landingpage/storia/shop-ebooks

  - Storyonline is a site funded and produced by the Screen Actors Guild and provides many award winning children's books read aloud by members of the guild. Access at http://www.storylineonline.net/

  - Tumble Books is a for fee site that provides many award winning children's books in digital formats. Access at http://www.tumblebooks.com/